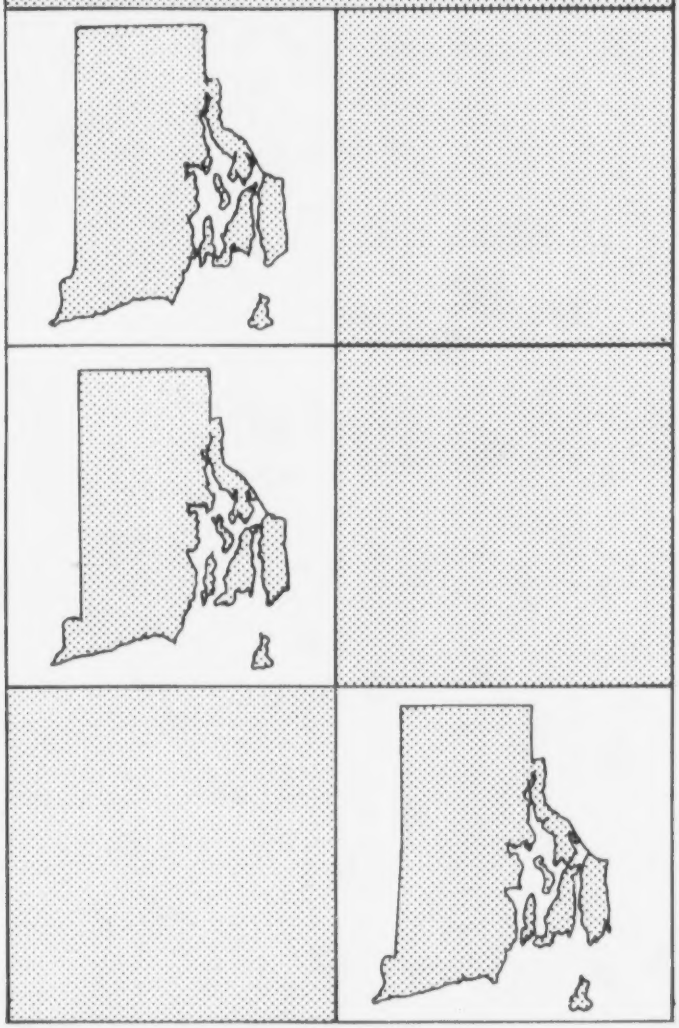
RHODE ISLAND'S HEALTH



Office of Data Evaluation
Health Planning and Resources Development
Rhode Island Department of Health

To

The Honorable Edward D. DiPrete, Governor

and

Members of the General Assembly

At this time I respectfully submit to you this latest report on the health of the people of the State. This report on Rhode Island's Health is the eighth report published under this title from the statewide comprehensive health database. Over the years this database has grown to become an invaluable health policy tool. It provides the capacity to identify strengths and weaknesses in the health status of Rhode Islanders as well as the health care resources available to serve them. The database provides the means to rank health priorities and to track progress in promoting health and improving access to affordable, appropriate health care.

It must be recognized in reviewing the pages to follow that the information generated by the statewide health database results from the cooperative efforts of numerous public, private, and non-profit organizations led by the Rhode Island Department of Health. Continued commitment and support are required to maintain and further enhance the database as new needs arise. Complex health policy issues will continue to receive increasing public attention, and the need for timely, accurate information will expand as well.

We can be proud that Rhode Island has distinguished itself as a leader in statewide health planning and innovative legislation in public health and safety. These strengths rest largely on the sound foundation provided by our unique data capabilities.

The Department of Health expresses its appreciation to the many organizations which contribute to the statewide database, and specifically to those whose contributions provided the basis for the various topics presented in this report.

H. Denman Scott, M.D., M.P.H.
Director of Health

Acknowledgements

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Rhode Island's Health
1985

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Introduction

This report is the eighth in the series, Rhode Island's Health. As in earlier reports, this edition focuses on selected topics of statewide policy interest. This publication highlights five concerns: the uninsured population, disability, health care expenditures, physician supply and head trauma incidence. Emphasis is on the description of characteristics and trends over time. In addition, a regional comparison is drawn for expenditure data.

A variety of databases has been manipulated to provide the figures presented here. Among these are the Rhode Island Health Interview Survey, performed by Rhode Island Health Services Research, Inc. (SEARCH) with the support and direction of the Office of Data Evaluation of the Rhode Island Department of Health and the Physician Information Survey, co-sponsored by the Rhode Island Department of Health and the Rhode Island Medical Society. Published data prepared by the Health Care Financing Administration, an agency of the United States Department of Health and Human Services, are the basis for health care expenditures information.

Rhode Island's Health is the most current contribution to the series providing legislators and other concerned citizens with a representative sample of the variety of health information. The series collectively serves as a tool to clarify aspects of complex health issues and to develop courses of action to meet the many current and future challenges of public health.

I. The Uninsured

As health costs continue to rise and program eligibility requirements tighten, there is growing concern for those who must pay all of their medical bills out-of-pocket. Their size and composition and the quality of care they receive are primary issues of current health policy. The Rhode Island Health Interview Survey, conducted in 1975, 1980 and 1985, provides detailed information on the size and characteristics of the population that is uninsured.

Over the past decade, the percentage of the population with no health insurance has grown dramatically in Rhode Island. In 1985, eight percent of the population had no insurance coverage. This represents a sixty percent increase over the percent uninsured estimated in 1980 and a percentage nearly three times as large as that found in 1975.

In general, socioeconomic situation is most crucially linked to health insurance coverage. Of those with annual family income under $5,000, one-third are covered only by government benefits in the form of Medicare or Medicaid (over one-half have some form of government health care benefits). Nevertheless, over one of every seven Rhode Islanders with income of less than $5,000 is uninsured. The risk is higher for those earning between $5,000 and $14,999: only sixteen percent receive governmental health benefits, and nearly one in five is uninsured. Ten percent of those with family income of $15,000 to $24,999 and only three percent of those with higher income are uninsured.

The impact of unemployment or layoff on health insurance coverage is high: over one-third of those who were unemployed or laid off in 1985 have no health insurance. The percentage of those unemployed or laid off who are uninsured has been growing since 1975, when less than one-fourth were uninsured.

Female-headed households are twice as likely to have no insurance as male-headed households (10.4% versus 5.1%), and those household heads who were employed part-time were three times as likely as full-time employed household heads to be uninsured.

By age, children and young adults are most likely to have no health insurance. Approximately one of every ten children under 17 years in Rhode Island and eighteen percent of those 18-24 years are uninsured. Thirty percent of the uninsured are children, and over fifty percent are under 25 years old.

To a limited extent, health insurance coverage determines availability of medical services. Twenty-two percent of the uninsured had no regular source of care versus nine percent of those with health insurance. Of those with a regular source of health services, 83 percent of the insured but only 74 percent of

the uninsured list a doctor's office as the primary source of health care services.

Those with health insurance are more likely to have visited a physician within the previous year. Only 63 percent of the uninsured saw a physician at least once; 78 percent of those with insurance had at least one physician visit. The difference is strongest among those 18-64 years of age, with about half the uninsured population and nearly three-quarters of the insured population reporting one or more physician visits.

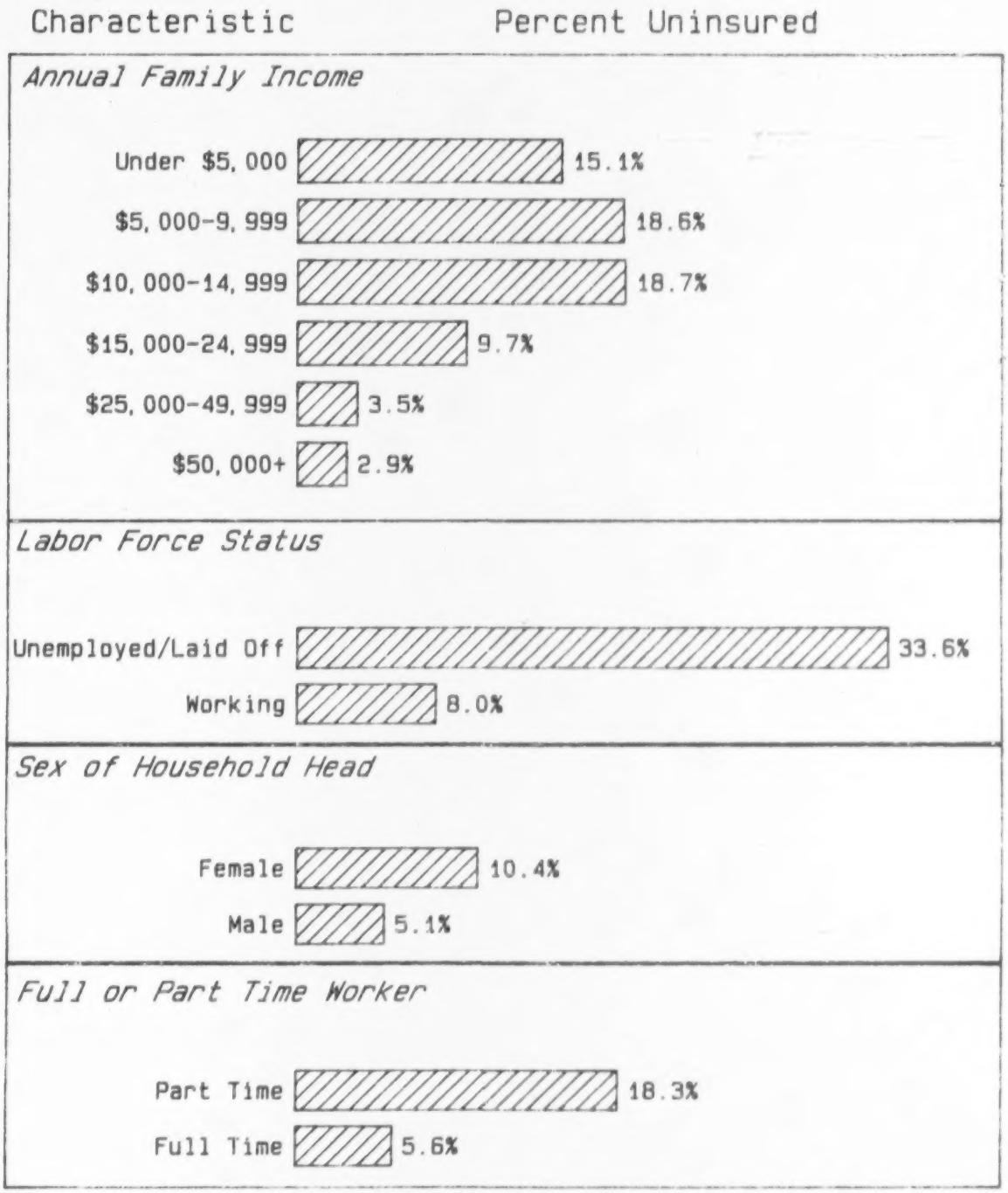
Although the elderly uninsured and insured report similar percentages with at least one physician visit in the past year, they have very different utilization patterns. Those 65 or older with health insurance had 4.5 physician visits on average in the past year; the uninsured saw a physician only 2.6 times on average in the same period. On the other hand, the general health status of the insured and the uninsured does not vary significantly within age groups, although there appears to be a greater tendency for the elderly who are uninsured to report themselves in fair or poor health.

In general, the uninsured do not appear disadvantaged in other health status or health service measures. For limitations of activities of daily living, presence of physician-confirmed high blood pressure, number of hospitalizations, average length of hospitalization, and work or school days missed due to illness or injury, the uninsured are similar to those who have health insurance.

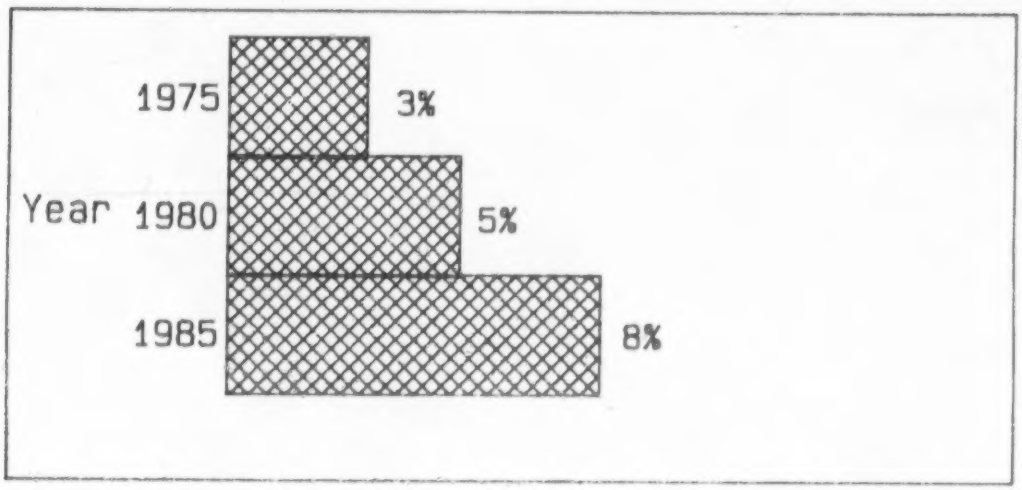
An important issue that can not be addressed by the available data is duration. Is there a core of the uninsured population that has no coverage for a substantial period? Or is the phenomenon primarily ephemeral, with families and individuals uninsured for only brief periods? What are the specific service needs of the uninsured?

Finally, the representativeness of the 1985 Health Interview Survey sample design for determining the uninsured population in Rhode Island should be questioned. The sampling method used was random selection of households within health service areas based on digits in their telephone numbers. The exclusion of households without telephones most likely leads to an underestimation of households in poverty and may underestimate households without private or publicly funded health insurance. Moreover, as the research unit is households, individuals who are transient or homeless are likely to be missed; these individuals or families also may comprise a significant proportion of the uninsured population. How many families have been overlooked? Answers to these key questions are needed in order to determine appropriate program responses to this problem.

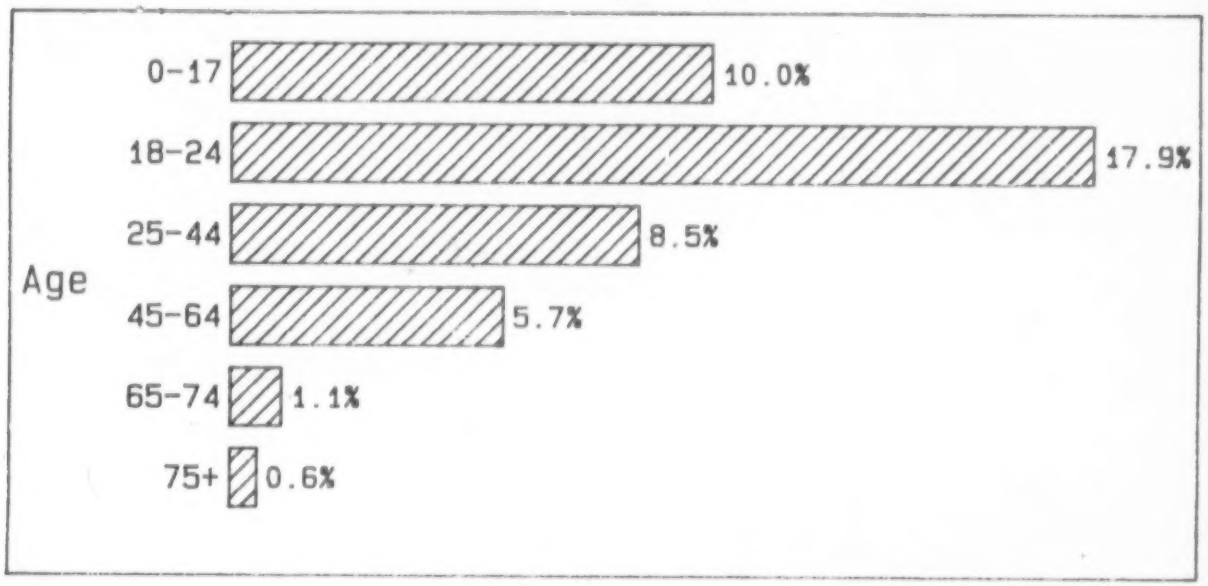
Percent Uninsured by Selected Characteristics



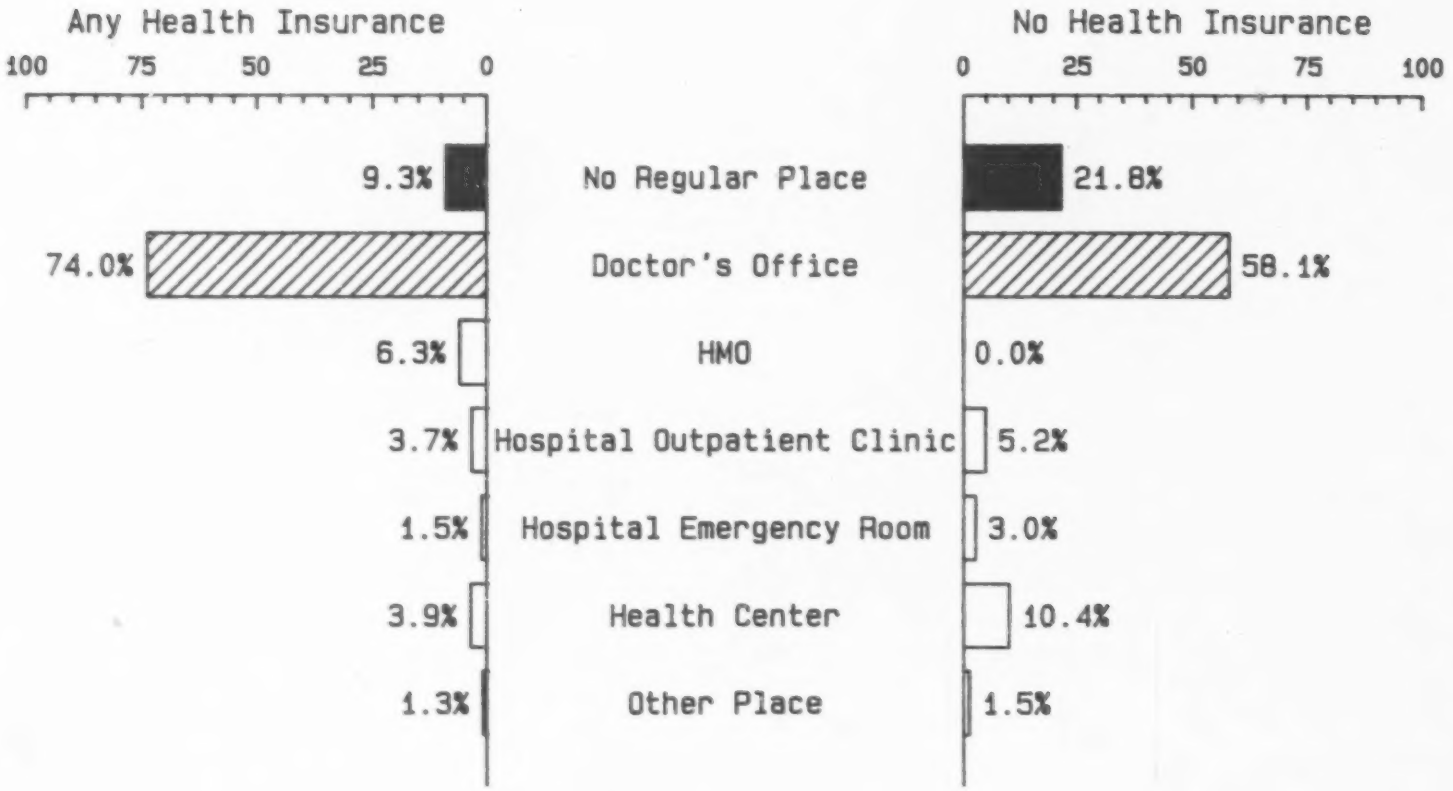
Percent Uninsured Over Time



Percent Uninsured by Age, 1985

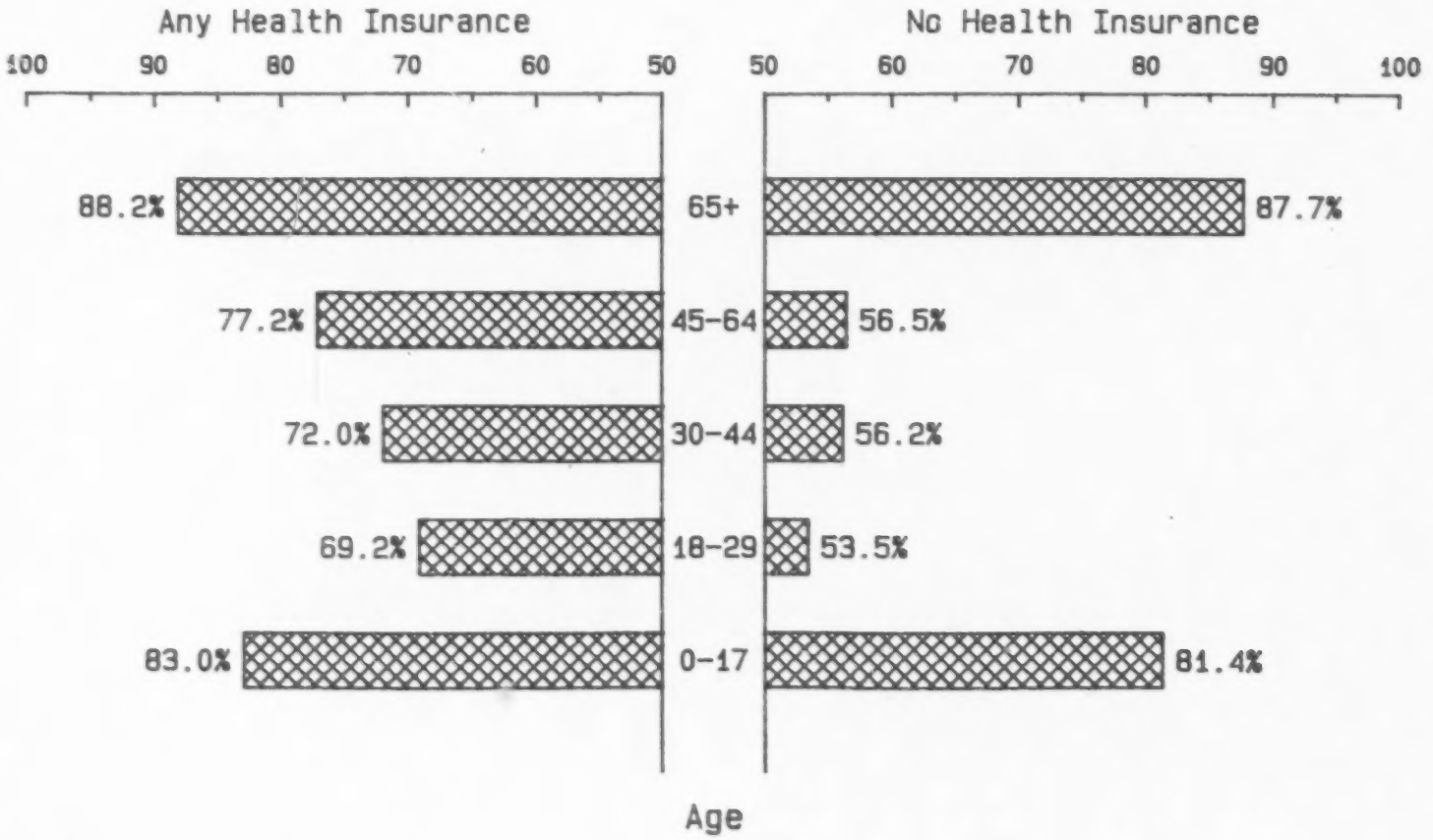


Distribution of Regular Place of Care by Insurance Coverage, Rhode Island, 1985

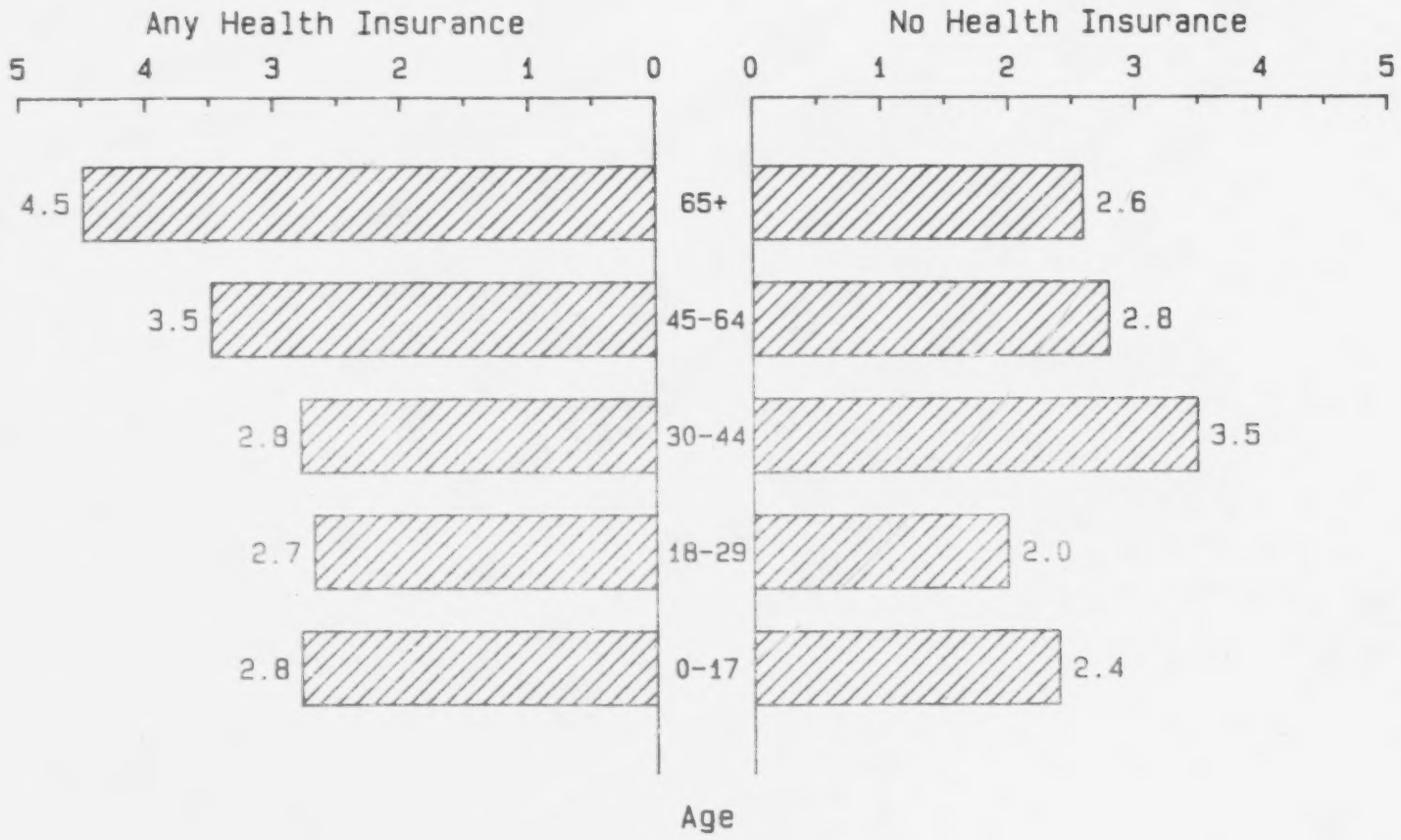


Regular Place of Care

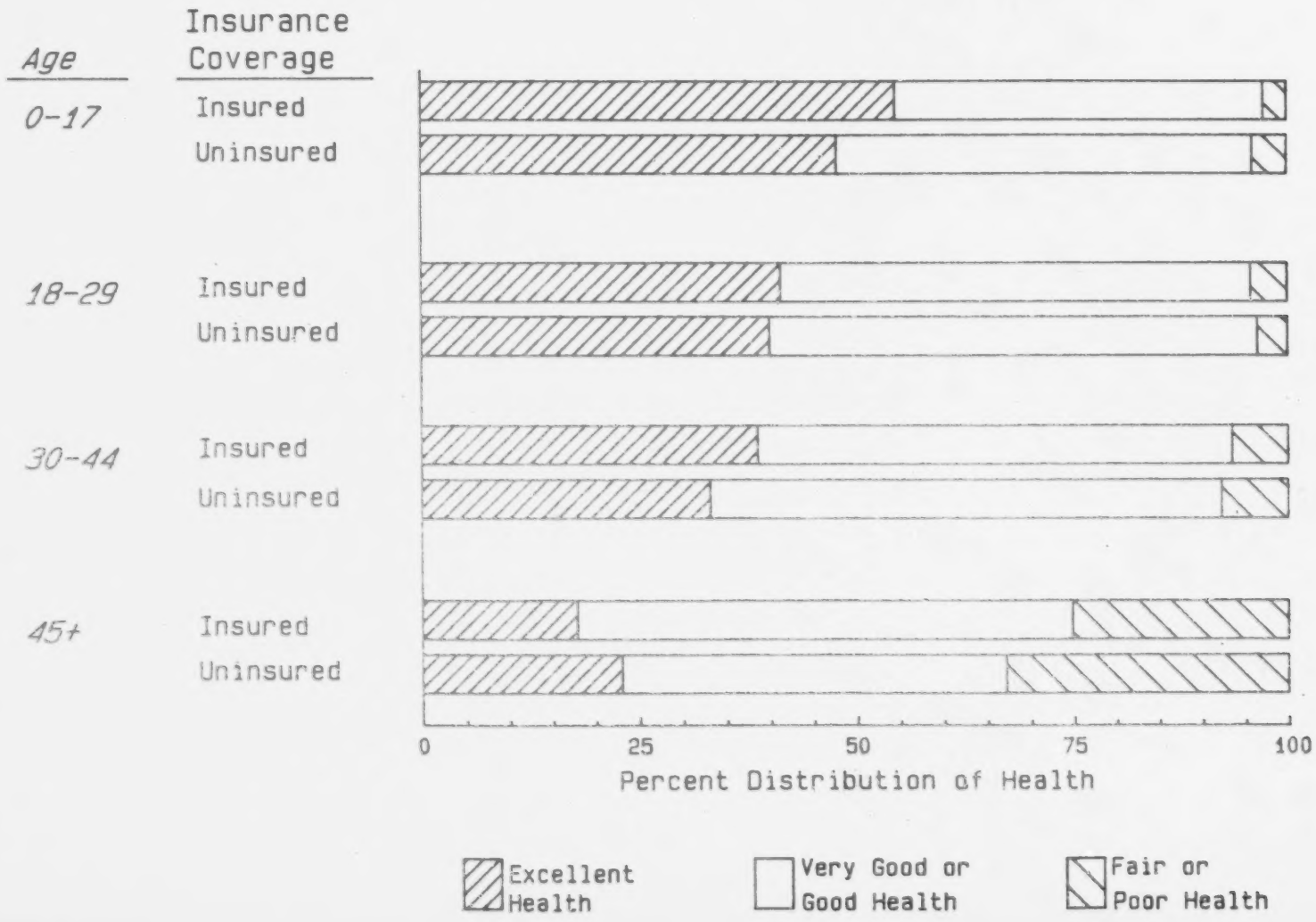
Percent Visiting a Physician in Past Year by Insurance Coverage and Age, Rhode Island, 1985



Average Number of Physician Visits in Past Year by Insurance Coverage and Age, Rhode Island, 1985



Distribution by Insurance Coverage and Age of General Health Status, Rhode Island, 1985



II. Disability

The nature and extent of self-reported disability in the noninstitutionalized population, derived from the 1985 Rhode Island Health Interview Survey, are discussed in this section. Disability can destroy or impair an individual's performance on the job, limit opportunities for employment, recreation and social life, impair mobility and access, and hamper and complicate daily activities in general. About fourteen percent of Rhode Islanders are unable to perform normal activities[1] or are limited in their ability to do so due to a disabling impairment or health problem.

As the population ages, interest in the prevalence of disability increases, for disability is primarily a problem of the elderly population. Rates of disability rise from under five percent of those under eighteen years to 29 percent of those 65-74 and 41 percent of those 75 or older. Approximately eleven percent of those 75 or older require assistance in personal grooming, eating or getting around the house, and these comprise half of those of all ages needing assistance for personal care.

Moreover, the disabled tend to be less healthy in other respects than the general population. Respondents were asked about their experience in the past year of 22 medical conditions and whether a doctor had diagnosed the condition. One-third of the general population and about three-quarters of the disabled reported they had one or more physician-confirmed health problems. The disabled were more likely to have multiple health conditions; 45 percent of the disabled had two or more physician-confirmed conditions. Among those who are not disabled only eight percent reported having more than one condition. Moreover, three-quarters of the non-disabled reported no health conditions.

Although multiple health conditions are most prominent among the elderly, the disabled at all ages are more likely to report over one health problem than those who are not disabled:

Table 2-1. Percent with Multiple Physician-Diagnosed Health Conditions

Age	Disabled	Not Disabled
Under 35	18.3%	2.4%
35-64	43.9	10.8
65-74	67.6	26.8
75+	64.3	31.4

[1] Normal activities are defined for those under 70 years and include working at a job or business, keeping house, or going to school. For those over 69, disability is defined by the reported need for assistance to perform personal care or routine tasks.

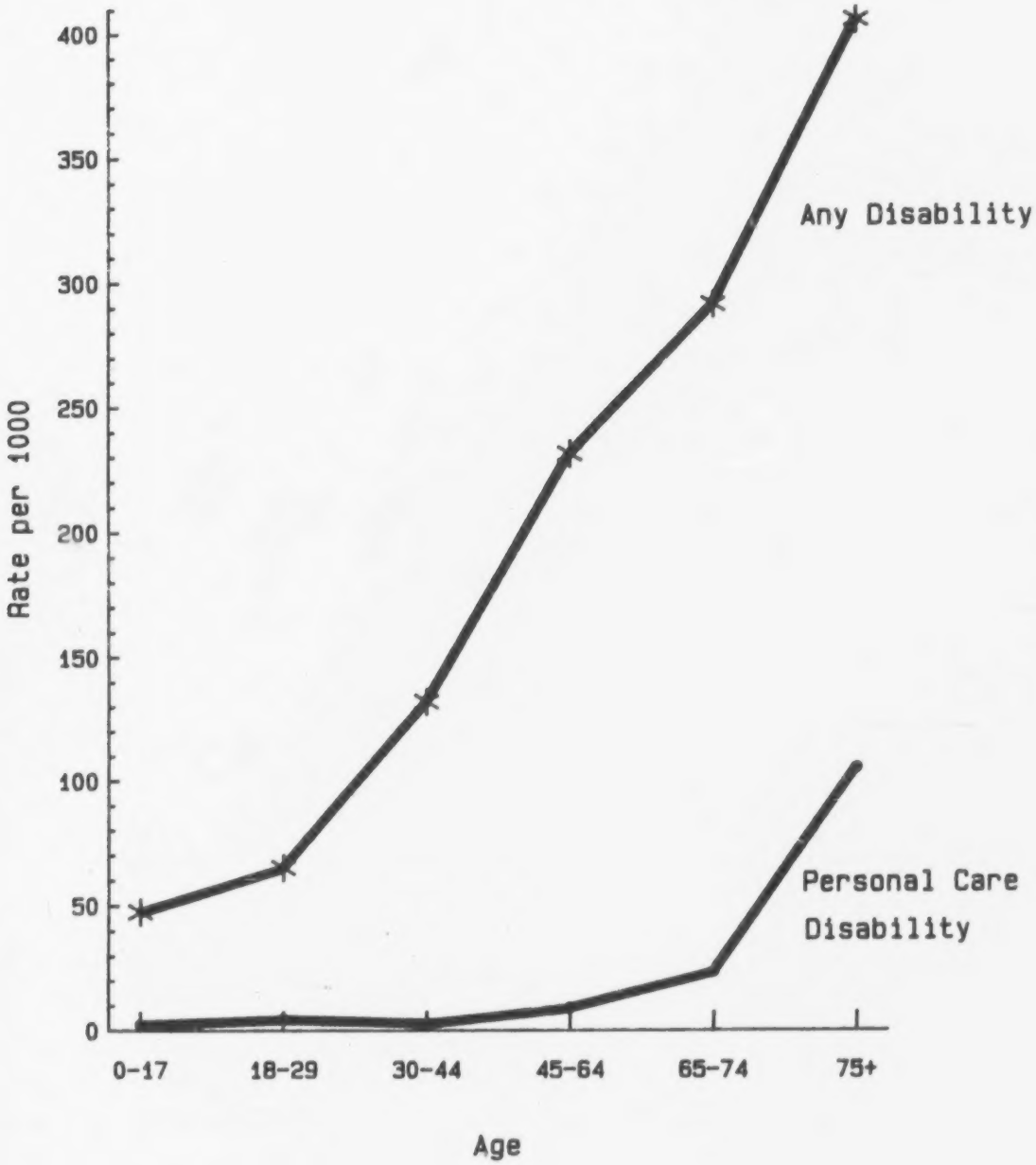
The extent of disability is also greatest among those with multiple health problems. Over one-fourth of those with multiple conditions report being unable to perform their normal activities at all; an additional 22 percent note that they are limited in the kind or amount of normal activities they can perform. For those reporting only one physician-diagnosed health condition, the figures are nine and twelve percent, respectively.

The most commonly reported health problem among the disabled is arthritis or rheumatism (32.7%), followed by high blood pressure (26.0%), chest pain or angina (13.2%), and other heart conditions (12.9%). In addition, with regard to all but two of the 22 listed conditions (a drug or an alcohol problem), reported diagnosis of a health condition is associated with disability. For example, those with arthritis or rheumatism are four times more likely to be disabled than those without arthritis and rheumatism. Stroke victims are almost five times more likely to be disabled; those with angina or chest pain are six times more likely; those with emotional or mental problems, those who have epilepsy, seizures or convulsions, diabetics, and the visually impaired are each four times more likely; asthmatics and those with emphysema or chronic bronchitis are three times more likely; and those with head injuries are twice as likely to be disabled as those who report that there has been no such physician-diagnosed condition.

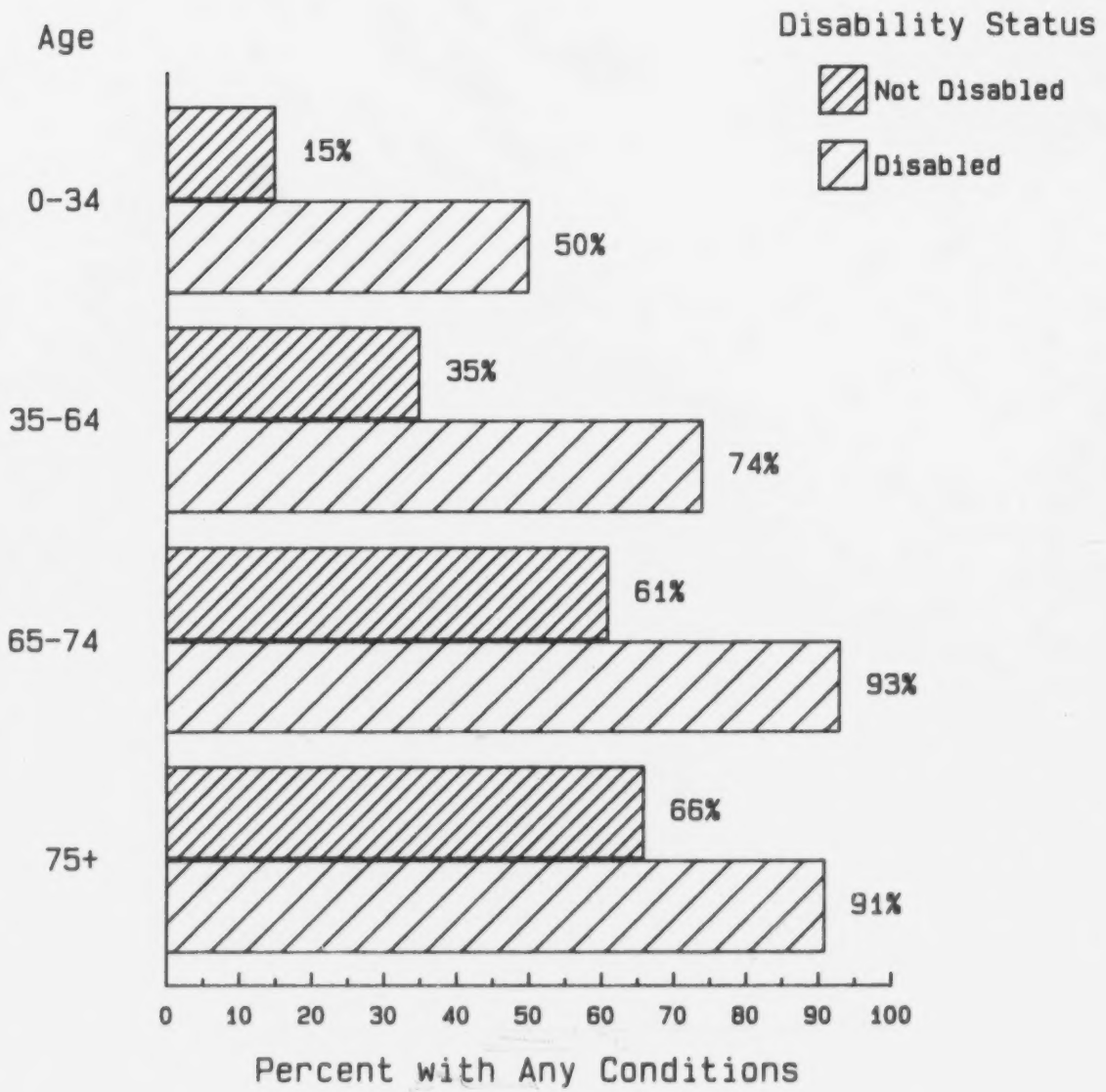
The reported age at the onset of disability is closely related to current age ($r=0.94$, $p<.001$). In particular, the elderly tend to report short-lived disability. It is possible that a household survey might miss older individuals with a long-standing disability due to institutionalization; the disabled moreover may have a shorter life expectancy, reducing the numbers with longer-standing disability as they age. In addition, individuals probably become acclimated to a disability of long standing over time and therefore focus on reporting more recent activity limitations, either because these limitations are of more recent origin or because they may be more disabling.

As might be expected, those in the prime working ages -- 18 to 64 years -- are most likely to report a disability lasting five or more years. About 60 percent of those under 18 years and those 65 years or older have been disabled under five years. Among those in the prime working ages, however, only 47 percent have been disabled under five years and one-third have been disabled ten or more years. At ages 65 and older, less than one-quarter have been disabled ten or more years.

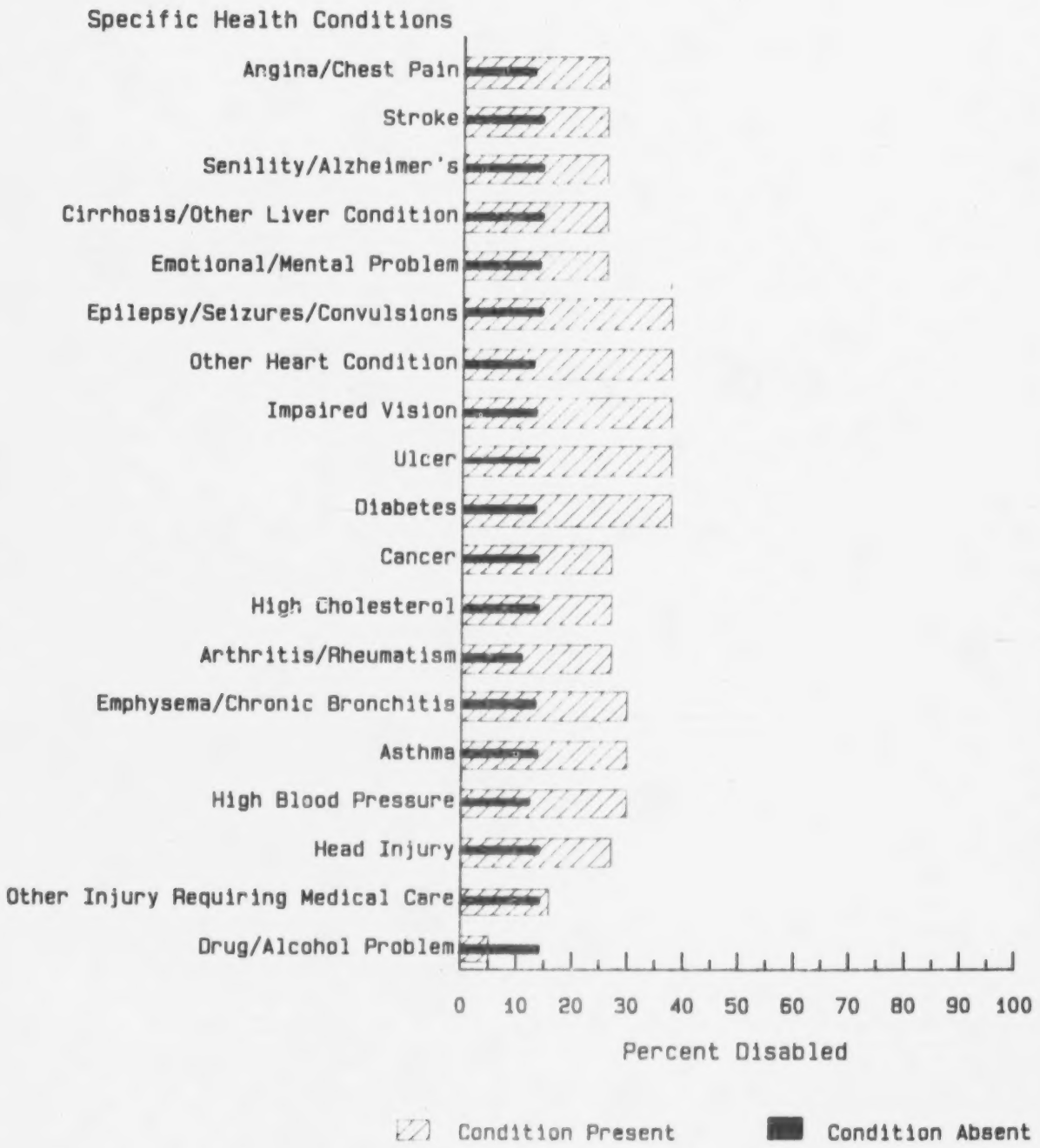
Prevalence per 1000 of Disability and Disability Involving Personal Grooming, Eating or In-Home Mobility by Age, Rhode Island, 1985



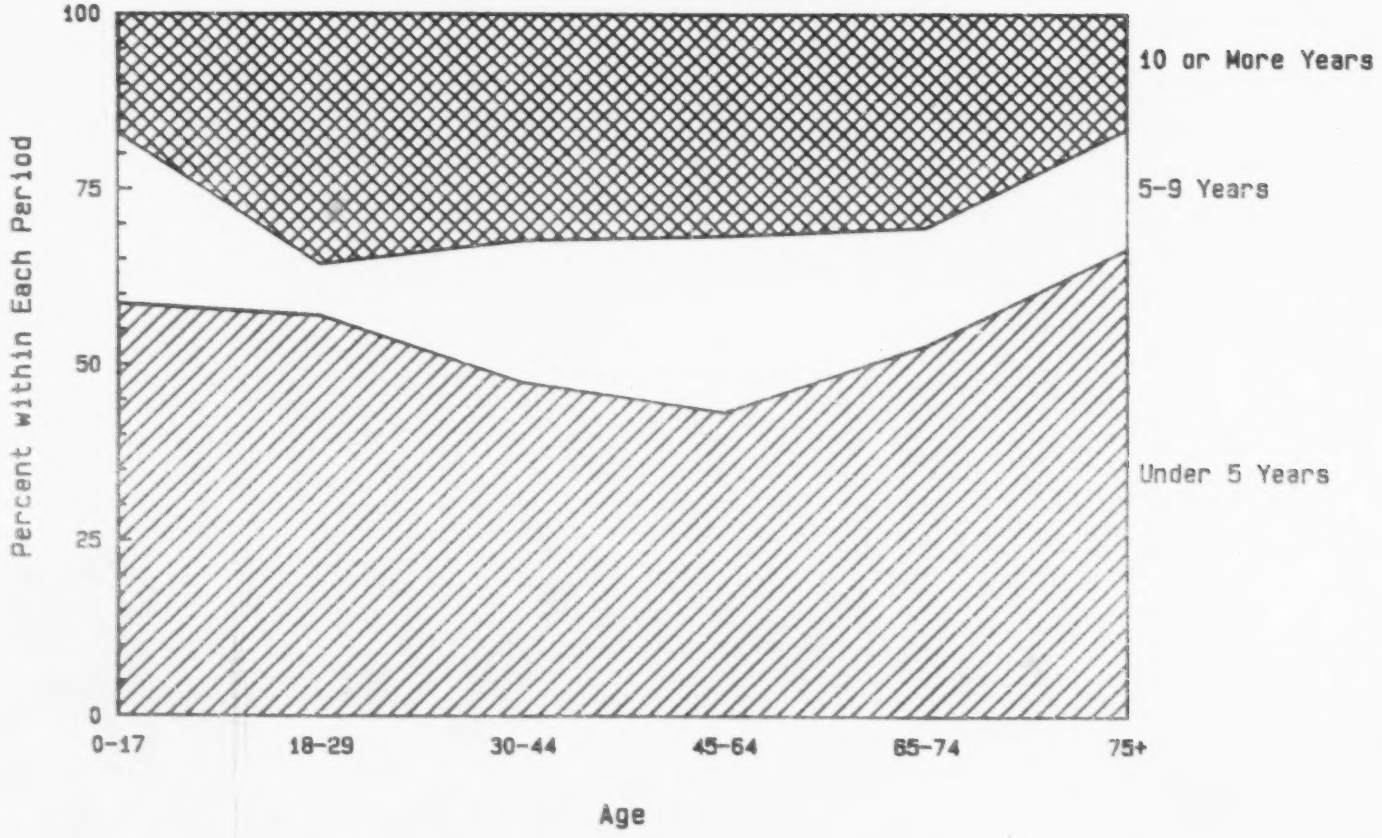
Percent with One or More Physician-Confirmed Health Conditions by Disability Status and Age, Rhode Island, 1985



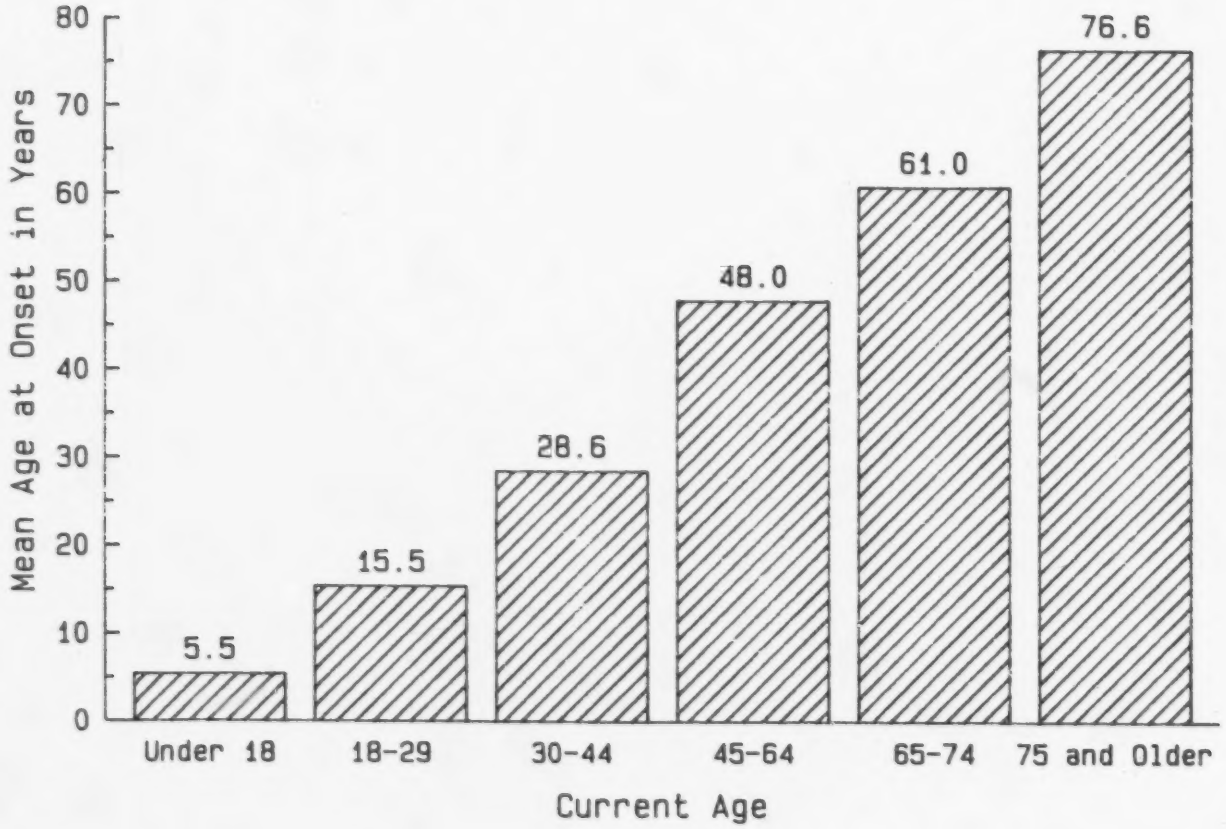
The Likelihood of Disability among Those with and Those without Specific Health Conditions, Rhode Island, 1985



Period of Activity Limitation by Age, Rhode Island, 1985



Mean Age at Onset of Disability by Current Age, Rhode Island, 1985



III. Health Care Expenditures

Cost containment has been the pivotal issue before health planners in recent years. Policy makers and all concerned citizens share this interest in controlling the costs of medical care. In this section, a comparison of expenses in Rhode Island with those in New England and the United States are presented.

Health care costs and utilization reported here are published estimates prepared by the Health Care Financing Administration (HCFA) from personal health care data for selected years (Levit, 1985) and Medicare program statistics (HCFA, 1984). The second data set is organized by the state of residence of Medicare enrollees, and includes only those costs reimbursed by Medicare. The first data set on the other hand, is based on all statewide personal health services. This data set is organized by place of occurrence of the service and thus includes some service provided to those residing in another state and excludes service to residents obtaining medical care out-of-state.[2] In longitudinal analyses, where noted, the effects of inflation in medical costs were removed by adjusting for changes in the medical care component of the Consumer Price Index (CPI), using 1976 as the baseline (U.S. Bureau of the Census, 1986).

An examination of per capita health care expenditures in 1982 for Rhode Island, New England, and the United States is shown in Table 3-1. Per capita expenditures are higher in Rhode Island than in each of the New England states except Massachusetts. However, the picture of per capita expenses in Rhode Island relative to Connecticut, New England, and the United States as a whole is reversed when the population 65 or older is used as the base, demonstrating the large burden of elderly in Rhode Island.

Table 3-1. Personal Health Care Expenditures in New England, 1982

Region and State	Per Capita	Per Capita 65+	Total in Millions
United States	$1,220	$1,052	$282,805.1
New England	1,356	1,059	16,853.6
Massachusetts	1,508	1,151	8,669.9
Connecticut	1,348	1,087	4,213.4
Rhode Island	1,351	972	1,287.9
Maine	1,091	846	1,239.5
New Hampshire	986	857	934.5
Vermont	978	836	508.4

[2] The ratio of charges by place of residence to charges by place of service for Medicare-covered, short-stay hospital expenses in Rhode Island in 1980 was 0.998, near unity (Levit, 1985).

Changes in per capita and total health care expenditures from 1966 to 1982 have been approximately equivalent in Rhode Island, New England, and the United States. Per capita expenses in real 1976 dollars over the entire period grew at an annual rate of four percent in Rhode Island and New England and 4.5 percent in the United States as a whole. Annual growth in current dollars between 1976 and 1982 in both total and per capita expenditures was approximately 17 percent in Rhode Island, New England, and the United States, a doubling between 1976 and 1982 (Table 3-2).

Table 3-2. Total and Per Capita Personal Health Expenditures, Rhode Island, New England and the United States, 1976, 1978, 1980 and 1982

	Total Expenditures in Millions			Per Capita Expenditures		
Year	Rhode Island	New England	United States	Rhode Island	New England	United States
1976	$636	$8,359	$131,517	$672	$686	$605
1978	791	10,251	165,969	831	834	747
1980	1,007	13,078	217,587	1,062	1,058	958
1982	1,288	16,854	282,805	1,351	1,356	1,220

There has been significant change in the relative size of two categories of personal health care expenditures from 1966 to 1982: (1) drugs and medical sundries, which declined from 13 percent of all personal health care costs in 1966 to six percent in 1982, and (2) nursing home care, which rose from six percent of all health costs for 1966 to 16 percent in 1982.

In real dollars, the greatest growth in per capita health costs occurred in nursing home services, which expanded 300 percent from 1966 to 1982. Part of this increase reflects aging of the population: the proportion 65 years or older grew 30 percent (from 11 to 14 percent) over this period. Nevertheless, nursing home costs per capita only for the population aged 65 or older swelled over 200 percent during this time, and Rhode Island ranked second among the states for nursing home service expenditures per capita in 1982 (behind Minnesota, where costs in real dollars were 10 percent higher per capita).

Professional services and hospital care expenditures per capita in 1976 dollars also grew from 1966 to 1982. Costs for hospital care increased 75 percent and dentists' services, 92 percent. Of some interest, physicians' services grew at a slower pace than did other personal health expenditures, at a rate of 44 percent over the period.

The pattern in 1982 of community hospital care in Rhode Island describes an older population with relatively high labor costs and a high use of labor-intensive services. Table 3-3 shows the pattern for Rhode Island and the United States and for

two contrasting states in New England. In terms of efficient use of community hospitals, Rhode Island had one of the highest occupancy rates in the nation in 1982, 84.9 percent, which was the highest rate in the New England region. However, this high occupancy was achieved through a low rate of admission and a high average length of stay, indicative of an older population. Days of care per employee, a crude indicator of labor productivity, was lower in Rhode Island than in the other New England states, describing the more labor-intensive character of Rhode Island hospital care. Yet costs per day of care were only slightly above the national average of $327 and far below those in neighboring Massachusetts, where a number of highly specialized hospitals provide costly, technologically advanced care.

Table 3-3. Community Hospital Statistics for Rhode Island, New Hampshire, Massachusetts, and United States, 1982

	New Hampshire	Rhode Island	Massachusetts	United States
Expenditures:				
per capita	$378	$485	$661	$495
per Day of Care	288	332	370	327
for Labor per Day of Care	164	211	216	186
per Admission	2487	3380	4105	2883
Other Statistics:				
Days of Care per Employee	95.6	83.9	85.1	96.9
Length of Stay in Days	7.1	8.5	8.9	7.6
Occupancy Rate	73.9	84.9	82.8	75.3
Admission Rate per 1000	138	134	143	157

Source: Levit, 1985, Table 12

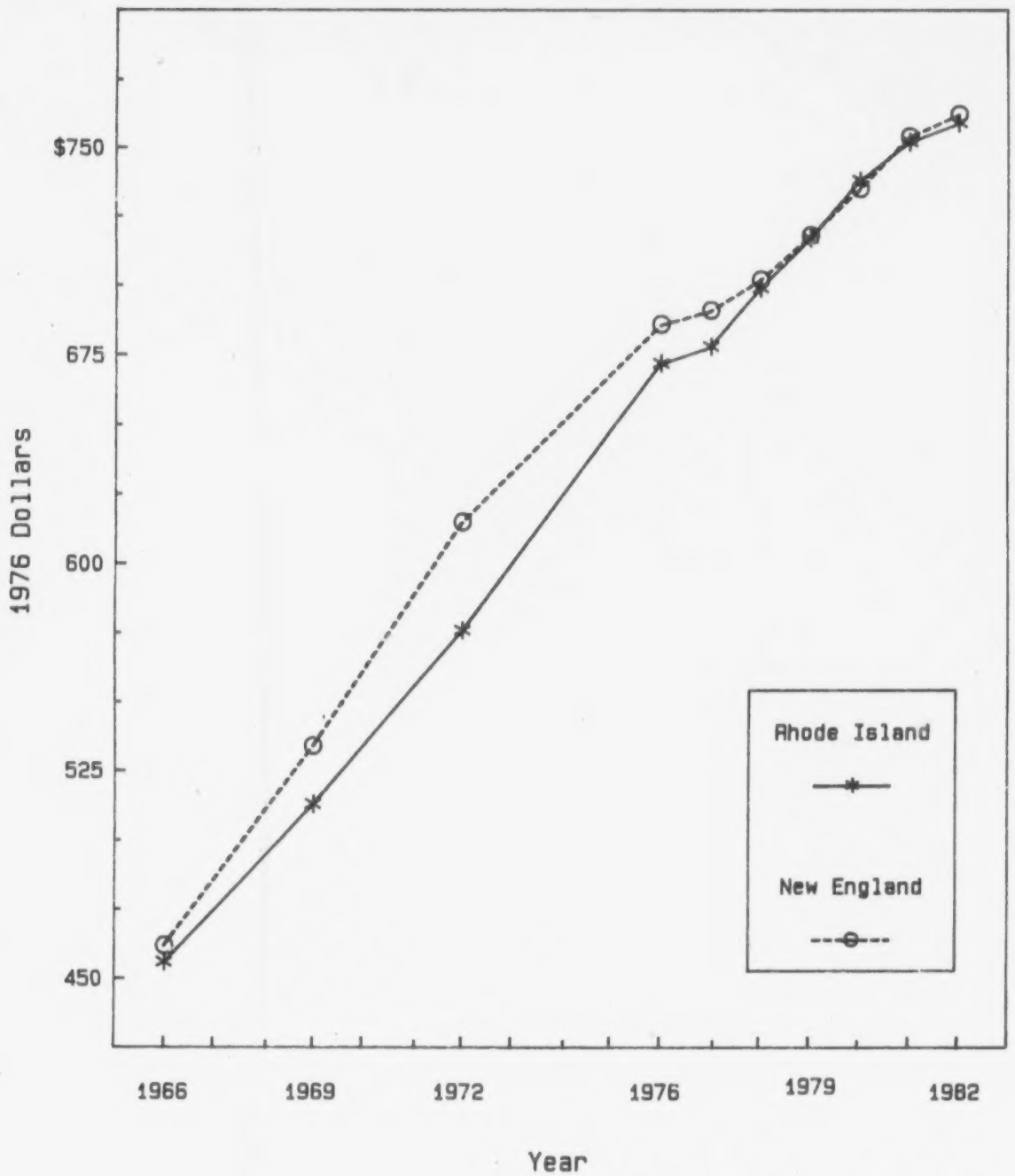
In fact, Medicare-covered short-stay hospital disbursements in 1976 dollars among Rhode Island elderly enrollees declined by two percent from 1981 to 1982, a reversal from the trend of the previous three years, when real growth in Part A (hospital insurance) benefit payments was approximately nine percent per annum. This reduction in real Medicare costs in Rhode Island was coincident with one factor tending to reduce costs -- a two-percent decline in the average length of stay for the Rhode Island elderly in short-stay hospitals -- and three factors tending to increase costs between these two years: (1) two-percent growth in the number of all short-stay hospital admissions; (2) an equivalent rise in the number of elderly Medicare enrollees in the State; and (3) a four-percent real dollar increase in average Medicare-covered, short-stay hospital charges per day for the aged.

From another angle, disbursements in current dollars increased nine percent between 1981 and 1982, while the average daily covered hospital charges climbed 16 percent during the same period (and the medical consumer price index rose 12 percent).

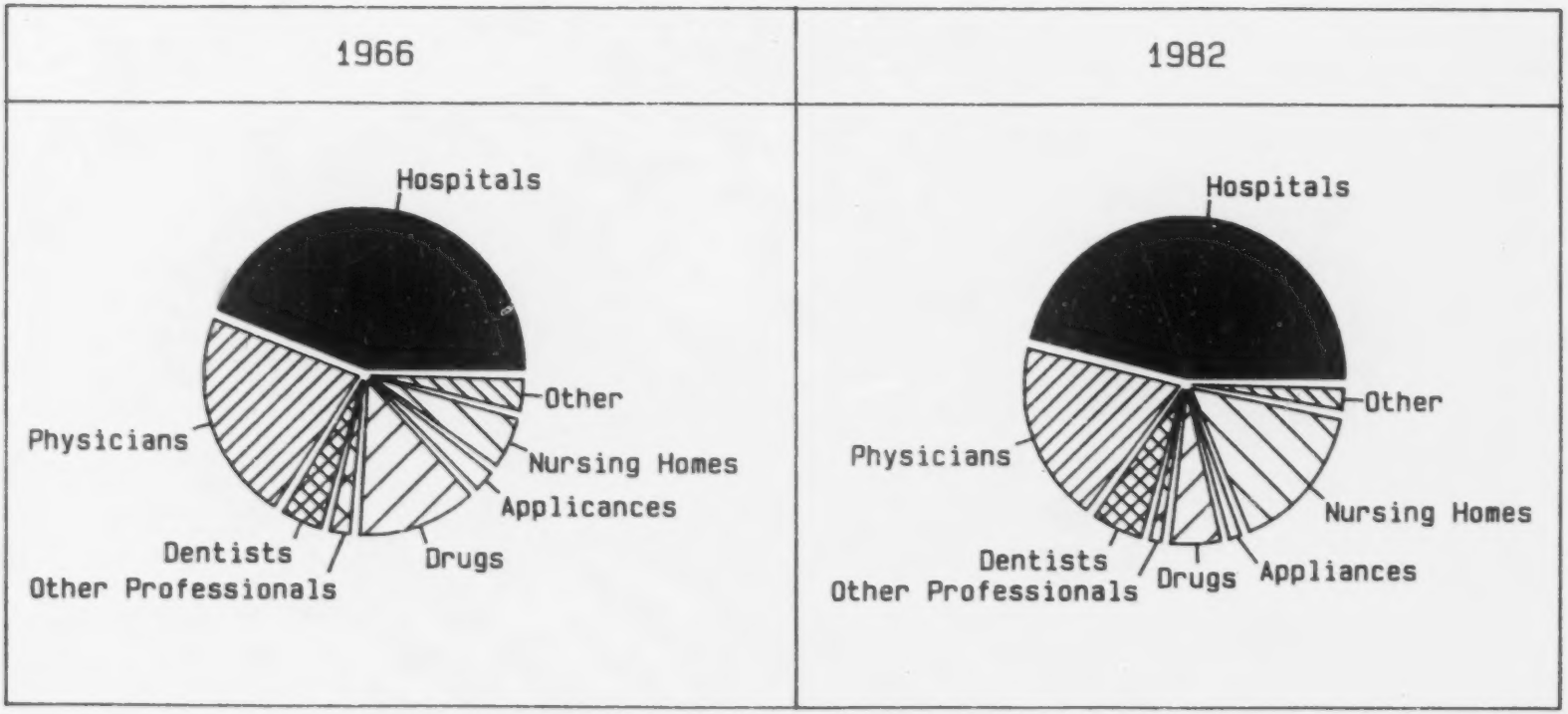
Given higher average daily charges, it seems likely that shorter hospital stays for a large proportion of all elderly Medicare hospital benefit recipients -- most likely better measured by median rather than average duration of stay -- may explain the failure of disbursements to keep up with inflation.

Between 1978 and 1982, however, average length of stay at short-stay hospitals among Rhode Island's elderly Medicare enrollees grew from 11.9 to 12.3 days, making Rhode Island one of only four States to experience such an increase. (The other States included South Dakota, Vermont and the District of Columbia.) Over the same period, Part A Medicare reimbursements per capita for this group grew 72 percent in current dollars (15 percent in real dollars).

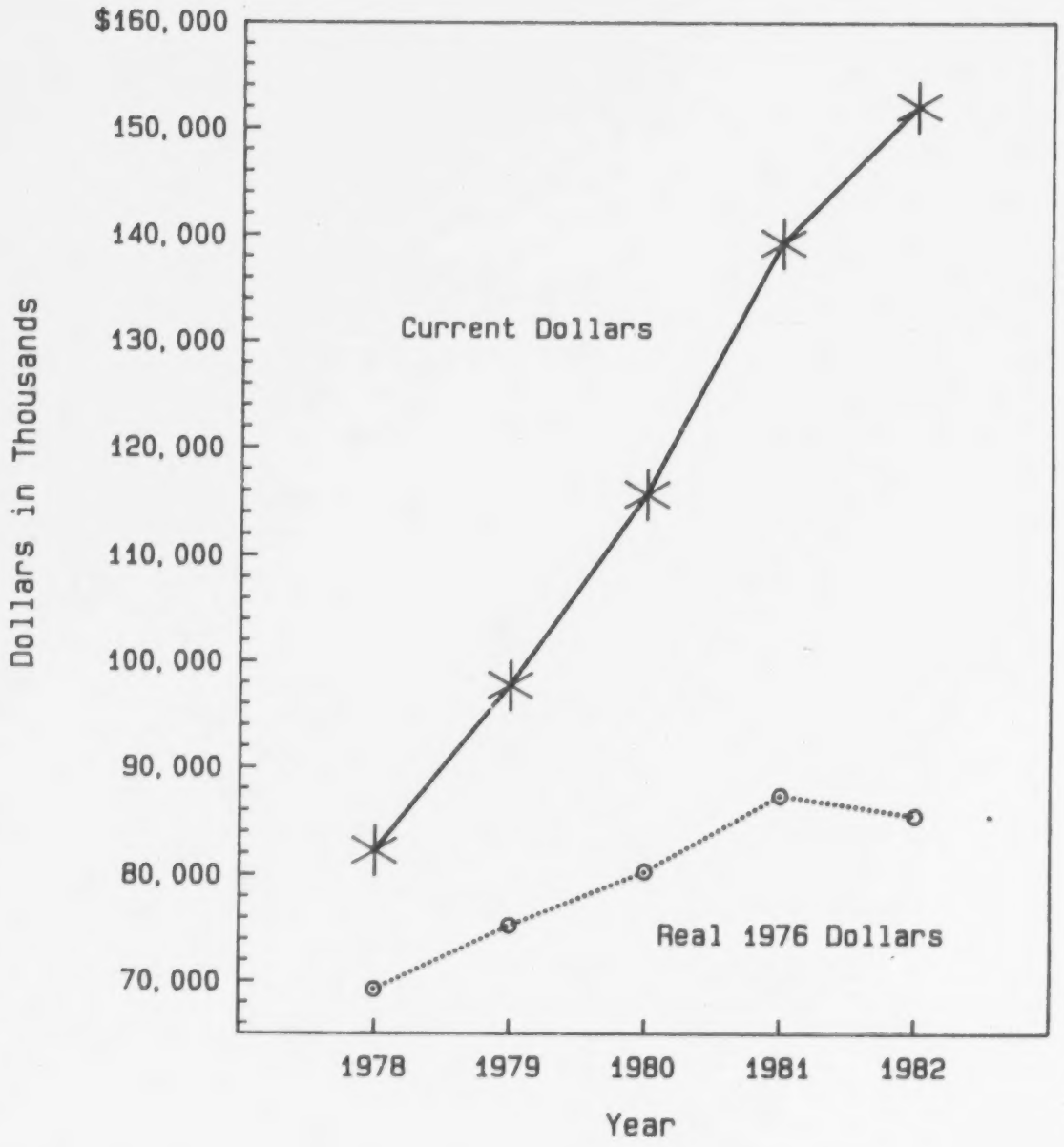
Health Care Expenditures Per Capita in 1976 Dollars, Rhode Island and New England, 1966, 1969, 1972, and 1976-1982



Distribution of Per Capita Health Expenditures by Expenditure Type, Rhode Island, 1966 and 1982



Medicare Hospital Insurance Benefit Payments in Current Dollars and Real 1976 Dollars for Elderly Enrollees in Rhode Island, 1978 - 1982



IV. Physician Supply

Access to a physician is a health policy issue of long standing. As the number of physicians grows, the question of distribution continues to be raised. This section presents trends in the distribution of nonfederal physicians -- both doctors of medicine and doctors of osteopathy -- who were providing patient care in Rhode Island in 1980 and 1984. Data were obtained from information reported by each physician on the 1980 and 1984 Physician Information Surveys, sponsored jointly by the Rhode Island Department of Health and the Rhode Island Medical Society. This survey was mailed by the Department to all physicians who held an active Rhode Island license on the date legally mandated for annual license renewal notification. Included in this report are physicians who: responded to the survey; are active in patient care (providing at least one hour of patient care per week); practice in Rhode Island (they reported a principal or secondary place of practice location in Rhode Island); and are not employed by the federal government. These decisions were based on licensure requirements and the desire for comparability in licensure.

The number of responding, eligible practicing physicians in Rhode Island grew by 14 percent from 1980 to 1984. Most of these are doctors of medicine (MDs), whose numbers increased from 1280 in 1980 to at least 1459 in 1984. Similarly, the number of doctors of osteopathy grew from 57 in 1980 to 61 in 1984 - an increase of seven percent. Nonresponse in the 1984 survey was estimated to be somewhat higher than in the 1980 survey, so that the growth figures presented here are likely to underestimate the true trend.

Examining the age-sex distributions at the two survey points, the predominant pattern is stability. The only significant changes between 1980 and 1984 ($p<.05$) can be found in the percentage of males under age 30, which declined by 39 percent, and the percentage of females 30-34, which expanded by 107 percent. These changes reflect the increasing recruitment of females by medical schools. In fact, among female physicians surveyed in 1984, over one-third were under 35 years of age; the comparable figure for males was 14 percent.

Although the number of female medical and osteopathic doctors has grown since 1980 at a much higher rate than the number of male physicians, males retain primacy in both professions. By age, the highest proportion of females in 1984 is for MDs under 30 years, in which women comprised 30 percent of the total. Nevertheless, among MDs the percent female in 1984 is higher than it was in 1980 ($p=0.52$), suggesting greater equality of opportunity today for women wishing to enter the medical profession.

Table 4-1. The Age-Sex Distribution of Physicians in Rhode Island, 1980 and 1984

Sex	Age	1980	1984	Change
Male	Under 30	4.1%	2.5%	-1.6
	30-34	11.8	10.3	-1.5
	35-49	35.9	38.9	+3.0
	50-59	20.4	19.0	-1.3
	60+	18.7	18.0	-0.7
Female	Under 30	0.6	1.1	+0.5
	30-34	1.4	2.9	+1.5
	35-49	4.1	4.3	+0.2
	50-59	1.9	1.6	-0.3
	60+	1.0	1.4	+0.4
GRAND TOTAL		100.0	100.0	
Number		1336+	1495*	

+One male physician did not report age in 1980.
*15 physicians did not report sex and 10 did not report age in 1984.

The data seem to indicate that the most prominent changes in physician composition have been limited largely to younger physicians. An examination of birth cohorts specifically confirmed this (see Table 4-2). Growth was limited to those born after 1930, for whom there was increase of 34 percent. For those born between 1946 and 1950 (ages 30-34 in 1980), there was a 45 percent rise in their numbers between 1980 and 1984. Among those born after 1950 -- the cohorts completing the medical degree and opening their practices during this period -- the number in 1984 was over three times as large as that in 1980. At the other extreme of age, those born before 1916, the number of practicing physicians shrank 41 percent in the years 1980-1984, as these older physicians retired or died.

Table 4-2. Trends in Physician Numbers, Rhode Island, 1980 and 1984

Date of Birth	Age in 1980	Number in 1980	Number in 1984
After 1950	<29	63	202
1946-1950	30-34	177	256
1931-1945	35-49	535	578
1916-1930	50-64	403	381
Before 1916	65+	158	93
ALL		1336	1510

Distribution of principal specialties among physicians in 1980 and 1984 is shown in Table 4-3. The categories which experienced the greatest increase in numbers included Psychiatry (31 additional physicians reported a specialty in Psychiatry in 1984 than in 1980), the residual category -- All Other Medical Specialties -- (26 additional), and Medical Subspecialties (23 more physicians). The largest declines were in general medical areas: General Practice (50 fewer physicians) and General Surgery (down by 11 physicians).

Table 4-3. Percent Distribution of Physicians in Rhode Island by Primary Specialty, 1980 and 1984

Specialty Type	1980	1984
General Practice^	11.8	7.5
Internal Medicine	13.6	13.9
Medical Subspecialties+	14.2	14.9
General Surgery	7.9	6.6
Surgical Subspecialties*	8.4	7.8
Obstetrics and Gynecology	6.0	6.8
Eye, Ear, Nose and Throat	4.5	4.9
Pediatrics	7.8	7.4
Radiology	5.1	4.8
Pathology	4.0	5.0
Anaesthesiology	3.5	4.0
Psychiatry	7.7	9.4
All Other Medical Specialties#	5.5	7.0
TOTAL	100.0	100.0

^Includes Family Practice

+Allergy; Cardiovascular Diseases; Dermatology; Diabetes; Endocrinology; Gastroenterology; Geriatrics; Hematology; Infectious Diseases; Neoplastic Diseases; Nephrology; Neurology; Physical Medicine and Rehabilitation; Pulmonary Diseases; Rheumatology.

*Cardiovascular, Colon/Rectal, Hand/Head/Neck, Neurological, Orthopedic, Pediatric, Plastic, Thoracic, Traumatic, and Urological Surgery.

#Aerospace, Emergency, General Preventive Medicine; Hypnosis; Legal Medicine; Nutrition; Clinical Pharmacology; Public Health; Occupational medicine; Other Specialties.

Growth in numbers has been fairly balanced also by location of medical education (see Table 4-4). In 1984, graduates of schools in the United States represented a slightly higher proportion of all Rhode Island physicians active in patient care. Growth between 1980 and 1984 was slowest among graduates of Asian and Middle Eastern medical schools. The fastest growing groups were graduates of Latin American and Canadian schools.

Table 4-4. Physicians in Rhode Island by Location of Medical Education, 1980 and 1984

Location of Medical School	Number		Percent	
	1980	1984	1980	1984
USA	931	1056	69.6%	69.8%
Europe and South Africa	187	206	14.0	13.6
Latin America and Caribbean	44	54	3.3	3.6
Canada	30	41	2.2	2.7
Middle East	44	48	3.3	3.2
Asia	101	108	7.6	7.1
TOTAL	1337	1513	100.0	100.0

The distribution of doctors by principal place of practice in 1984 versus 1980 suggests no major increase in physician dispersion over the four-year period. This trend is shown in Table 4-5. Warwick, Providence, South Kingstown, North Smithfield, Cranston and North Providence represented 68 percent of the State's practicing physicians in 1980 and 70 percent in 1984. Increases in physician supply in these six places accounted for 87 percent of the growth since 1980.

On the other hand, most municipalities experienced growth in physician supply between 1980 and 1984. The number of physicians in Middletown trebled. Moreover, three relatively unpopulated places in which no medical representative had been reported in 1980 had acquired a medical practitioner by 1984 (Hopkinton, New Shoreham, and Richmond). Only in Exeter, Johnston, Smithfield, and West Warwick did physician supply as determined by these surveys decline; the number of doctors who reported an active practice in these places was down 19 percent overall over this period.

Table 4-5. Trends in the Distribution of Physicians in Rhode Island by Principal Place of Practice, 1980 and 1984

	1980	1984		1980	1984
Barrington	6	7	New Shoreham	0	1
Bristol	12	12	Newport	54	54
Burrillville	5	6	North Kingstown	10	12
Central Falls	8	9	North Providence	18	25
Charleston	2	3	North Smithfield	14	23
Coventry	5	5	Pawtucket	113	115
Cranston	97	104	Portsmouth	2	2
Cumberland	15	15	Providence	645	727
East Greenwich	5	6	Richmond	0	1
East Providence	40	43	Scituate	2	2
Exeter	2	1	Smithfield	5	3
Foster	1	1	South Kingstown	28	38
Glocester	2	2	Tiverton	3	3
Hopkinton	0	1	Warren	2	2
Jamestown	2	3	Warwick	93	126
Johnston	16	15	West Warwick	9	8
Lincoln	3	4	Westerly	36	38
Little Compton	1	1	Woonsocket	53	55
Middletown	3	9			
Narragansett	5	5	TOTAL	1317	1487

Most doctors in 1984 were self-employed in solo practice as in 1980. However, a larger percentage were seeking other forms of employment by 1984. There actually was a decline in the percentage in traditional solo practice between 1980 and 1984. The number of self-employed physicians in partnership, on the other hand, grew 28 percent, from 146 in 1980 to 187 in 1984. Moreover, the number of physicians employed by others grew by

nine percent; in particular, employees of partnerships and HMOs leaped from 177 to 235, a 33 percent increase.

Despite the continuing preeminence of the physician's office as the primary employment setting (53% of those who reported employment setting in 1984 cited "office"), a lower percentage of physicians opted for the traditional office practice in 1984 than in 1980 (when 58% were so based). The number of doctors based in hospitals grew from 453 to 537 - nearly 20 percent, and those in HMO's or neighborhood health centers increased from 44 to 67, a 52 percent climb.

In addition, acceptance of Medicare assignment as payment in full is up from 69 percent for services provided in the office and 68 percent for services provided in the hospital in 1980 to 76 percent for in-office services and 84 percent for in-hospital services in 1984. Participation in Blue Shield has risen as well from 78 percent to over 90 percent of those physicians who responded to the question. On the other hand, the percent accepting new patients has not changed significantly nor has acceptance of Medicaid reimbursement as payment in full.[3]

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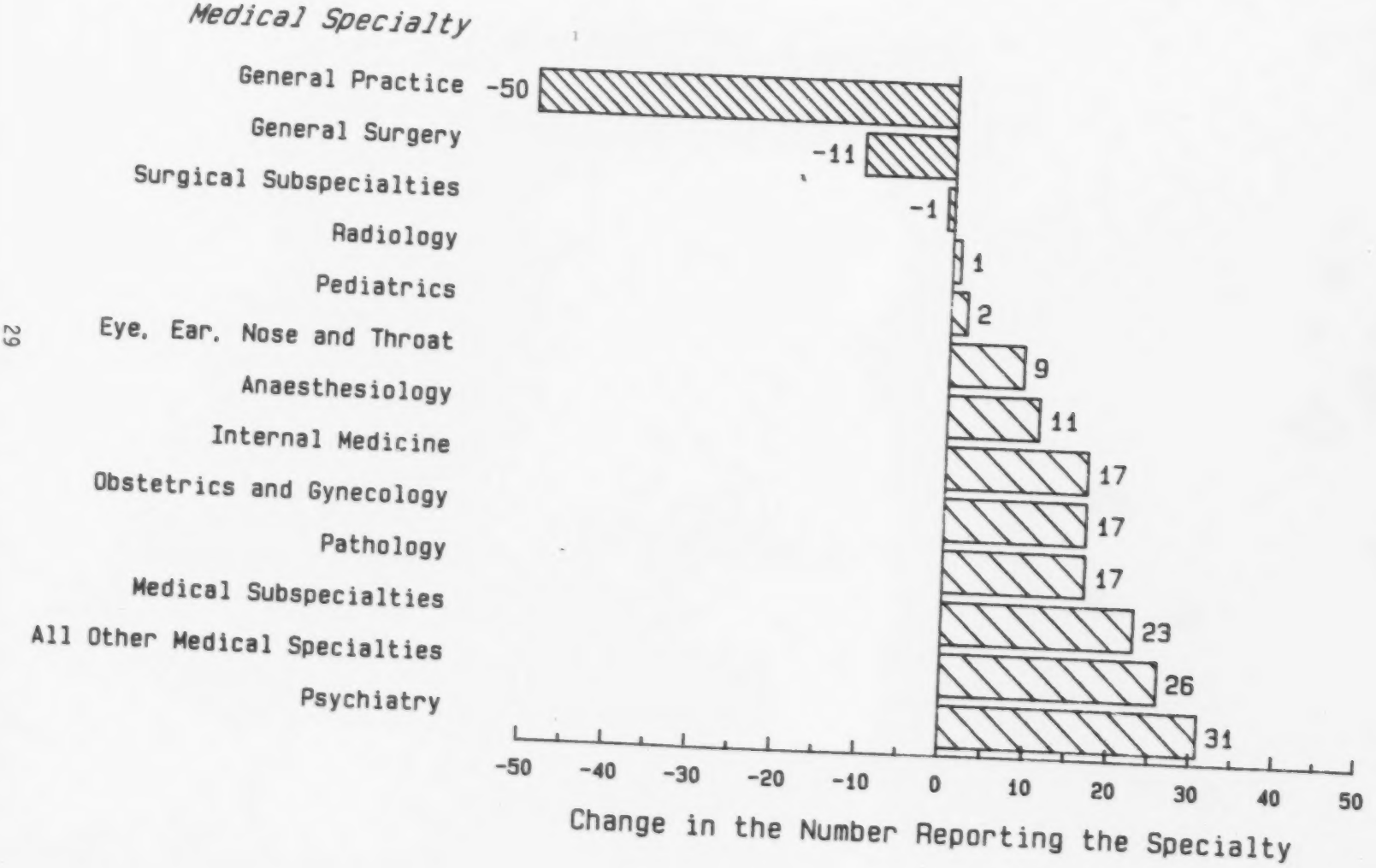
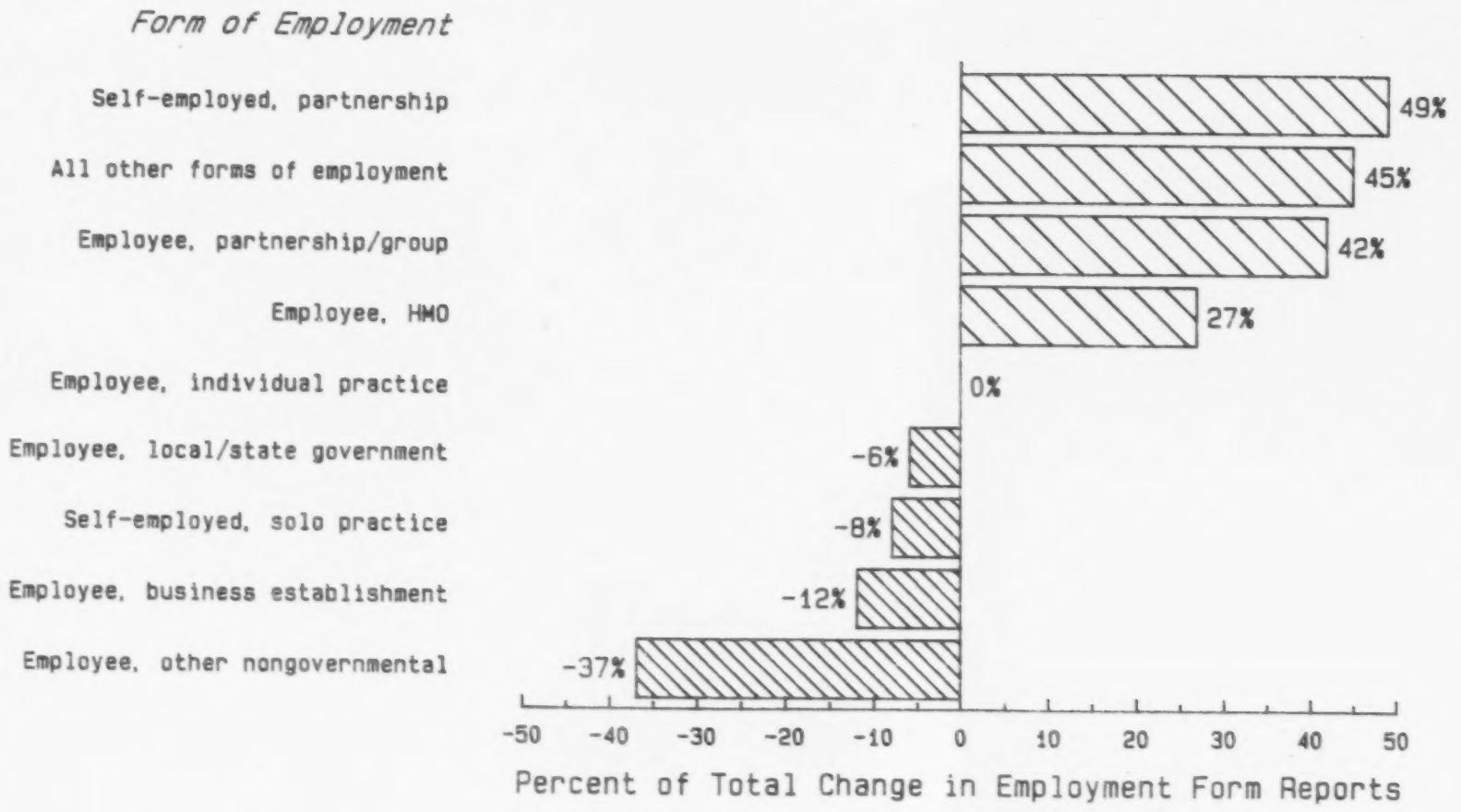
[3] An error in one of the questionnaire directions to respondents resulted in 13 to 36 percent nonresponse on these items. Analysis indicated that the results obtained were nonetheless robust.

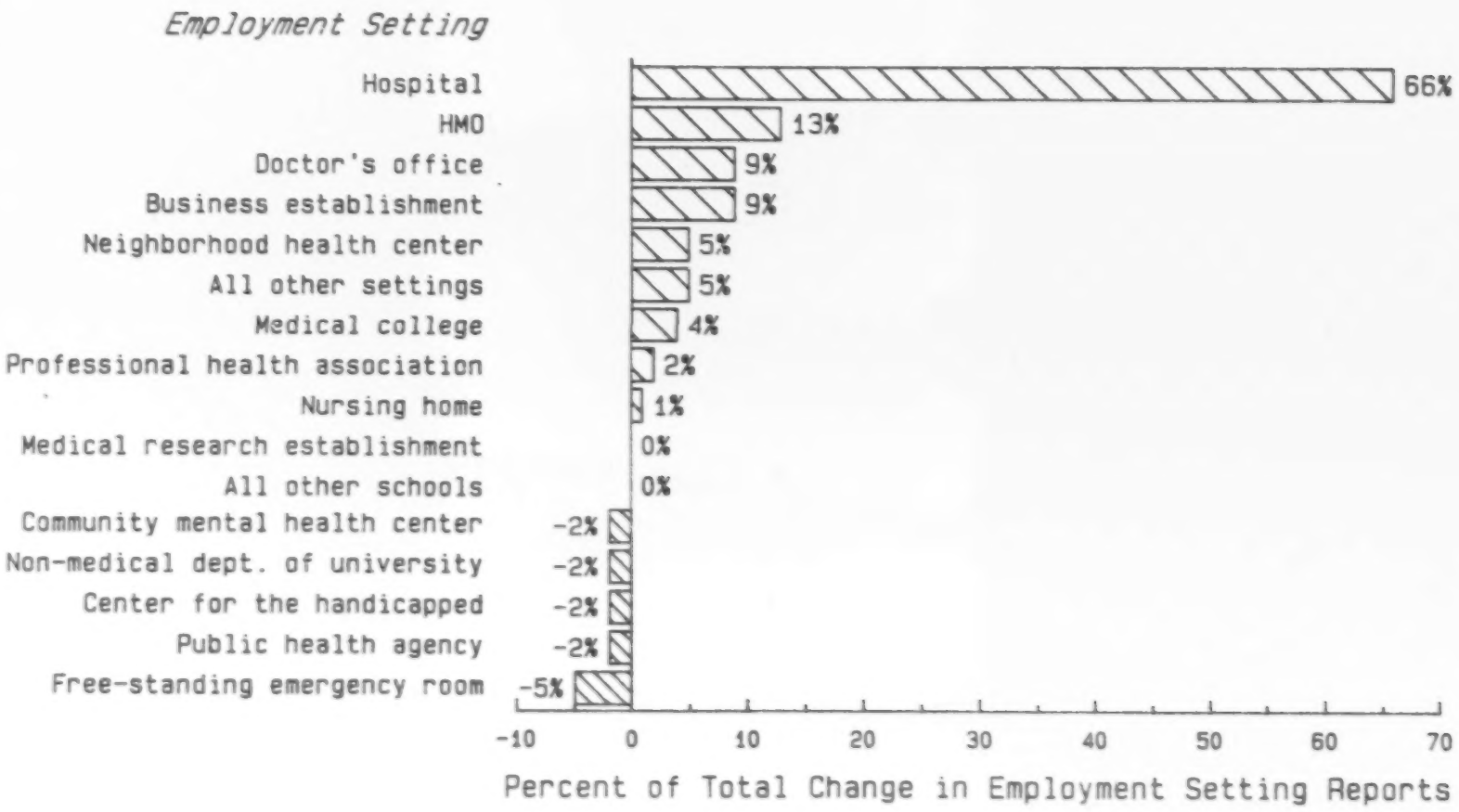
Growth in Medical Specialties, Rhode Island, 1980 - 1984



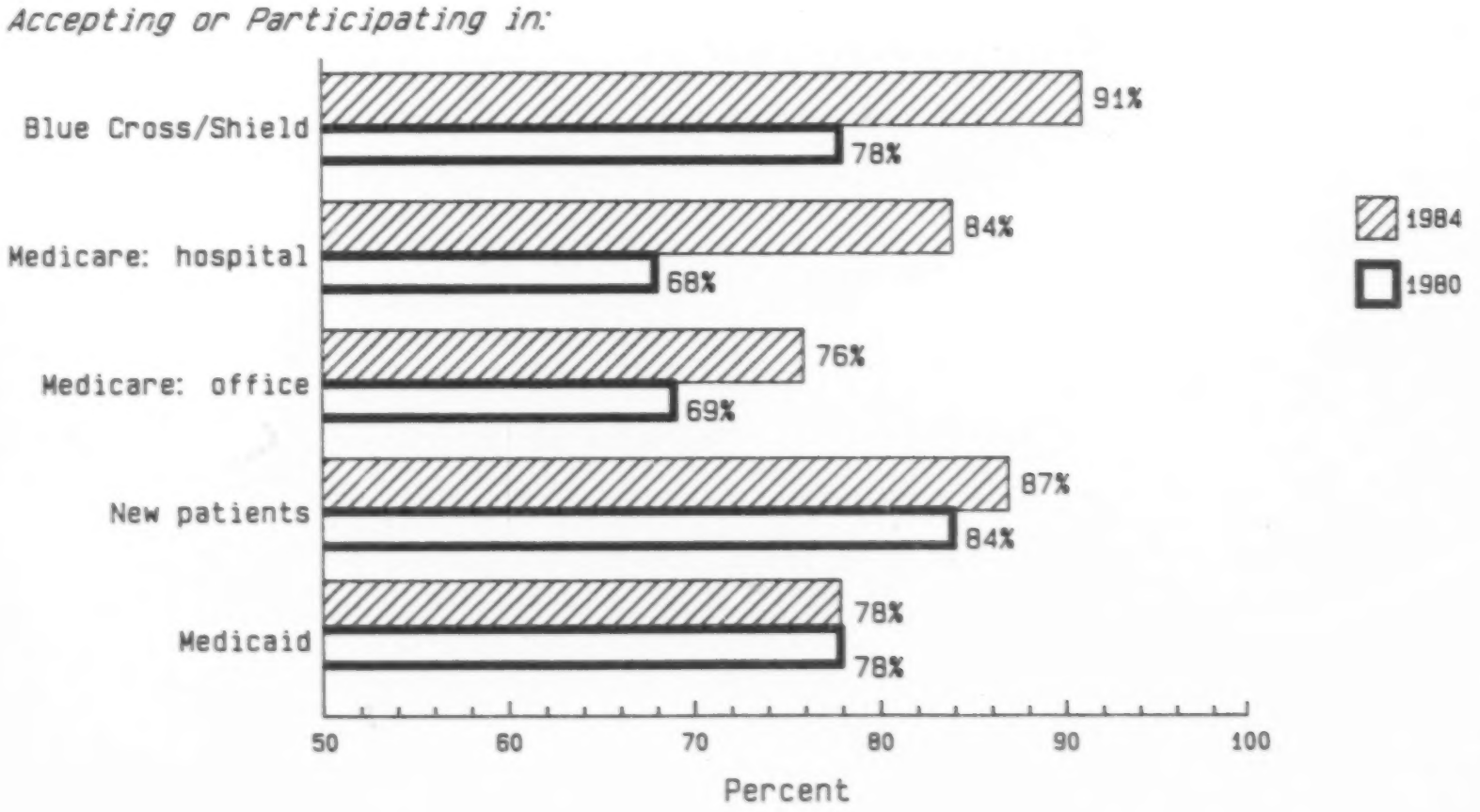
Changes in Form of Employment of Physicians, Rhode Island, 1980 - 1984



Changes in Employment Setting of Physicians, Rhode Island, 1980 - 1984



Percentage of Physicians Accepting New Patients or Participating in Various Payment Programs, Rhode Island, 1980 and 1984



V. Head Trauma

Head injuries attack the public health both by a high case-fatality rate and by causing survivors subsequent disability. In a recent article in the American Journal of Public Health (July 1986), head injury in Rhode Island was examined through analysis of Rhode Island Professional Activities Study (PAS) data for the years 1979 and 1980 (Fife et al., 1986). In that study, head injury was defined as diagnosis at hospital discharge of the following International Classification of Disease, Ninth Revision, codes (U. S. Department of Health and Human Services, 1980):

800	Fracture of vault of skull
801	Fracture of base of skull
803	Other and unqualified skull fracture
804	Multiple fractures involving skull or face with other bones
850-854	Intracranial injury excluding those with skull fracture.

The same source and definition here provide data for the years 1981 through 1983, and the incidence, causes and outcomes of head injury involving hospitalization in Rhode Island to residents in 1981-1983 are described.

There were 3785 hospitalized cases of head injury in Rhode Island to Rhode Islanders from 1981 through 1983. This number does not include (1) hospitalizations in-state to non-residents, (2) hospitalizations out-of-state to Rhode Island residents, and (3) any head injury in which the individual was not admitted to a hospital (either because the injury did not require hospitalization or because the person died before hospital admission). On an annual basis, the incidence rate (using the 1980 Census count as the population at risk) for 1981-1983 was 133 per 100,000. Nearly two-thirds of the injuries occurred to males, and in each age group, the incidence was higher for males than for females.

The annualized incidence of head injury with hospitalization by age shows two peaks, at the extremes of age. The incidence for males either under 25 years or 75 years and older is three times the rate for males aged 45-54. Among females, the incidence of head injury involving hospitalization for those under 25 is again three times the rate at ages 45-54, while the incidence rate for women 75 years or older is over four times higher than the rate prevailing for those 45-54 years.

Overall, approximately five percent of all Rhode Islanders hospitalized with head injury died in the hospital. The hospital death rate rises with age, from a low of 0.8 percent for those under 5 to 16.3 percent at ages 75 or older.

The proportion dying in the hospital is highest for those with intentionally self-inflicted injuries, of whom over half do not survive. This rate is significantly higher ($p<.001$) than the proportion discharged dead from any of the other major causes of head injury: motor vehicle, falls or assaults. On the other hand, those with a head injury from any other specified cause had a significantly lower percentage discharged due to death (0.7%) than those having any of the major causes:

Cause	ICD-9-CM Code	Percent Dying
Self-inflicted Injuries	E950 - E959	53.8%
Motor Vehicles	E810 - E823	5.2%
Falls	E880 - E886, E888	5.4%
Assaults	E960 - E978	2.7%
Cause Not Specified	---	5.8%

In addition to their high hospital mortality, those with intentionally self-inflicted head injuries had a rate of intensive care unit (ICU) use 3.5 times higher than the ICU admission rate for head injuries from any other causes (54% versus 15%). Head injuries involving motor vehicles were also more likely to have an ICU admission (23%). Victims of falls with resultant head injury, alternately, were less likely to be admitted to an ICU (12%) than were others with head injuries.

In general, of head injuries with reported causes (N=2768), motor vehicles and falls each accounted for over a third, assaults for nine percent, intentionally self-inflicted for less than one percent, and residual causes for 19 percent. Motor vehicles are the primary specified cause of head injuries for those 15 to 44 years of age, as are falls for children under 5 and adults over 54 years (see Table 5-1).

Table 5-1. Distribution of Cause of Injury by Age for Rhode Islanders Hospitalized with Head Injury, 1981-1983

Age	No E-Code	Motor Vehicle	Falls	Self-Inflicted	Assault	All Other	Total	Number
0-4	16.9%	9.6%	60.8%	0.0%	1.7%	11.0%	100.0%	355
5-14	18.1	17.2	28.0	0.0	1.4	35.3	100.0	714
15-24	26.8	38.9	10.0	0.5	10.9	13.0	100.0	1042
25-34	28.2	35.4	11.2	0.8	15.0	9.3	100.0	525
35-44	30.0	26.9	21.9	0.8	10.0	10.4	100.0	260
45-54	29.7	27.6	28.6	0.0	7.0	7.0	100.0	185
55-64	33.3	21.0	35.9	1.0	3.6	5.1	100.0	195
65-74	37.8	13.4	44.2	0.0	1.7	2.9	100.0	172
75+	40.9	6.5	49.6	0.0	0.6	2.4	100.0	337
TOTAL	26.9	25.2	26.5	0.3	6.9	14.2	100.0	3785

For the population under 35 with head injuries, motor vehicles were the primary cause of lengthy hospitalization. Approximately eight percent of motor vehicle injury cases had a hospital stay of 30 or more days, and nearly a third were hospitalized for a week or more. Only nine percent of head-injured fall victims under 35, in contrast, remained hospitalized for at least a week, and the median length of stay for those under 35 with head injuries from any cause (specified or unspecified) was two days.

Assaults resulted in lengthier hospital stays in the population under 35 years than did any cause other than motor vehicles. One- quarter of those residents 0-34 years admitted to a Rhode Island hospital with a head injury after an assault remained in the hospital at least one week.

Among those aged 35-64 or 65 and older, there were no differences in length of stay by cause of head injury that were statistically significant. For those 35-64 years, the median length of stay was five days; for those over 64, the median was 8 days.

The longest hospital stays by age were associated with discharge to a skilled nursing or intermediate care facility (see Table 5-2). Motor vehicle accidents (MVAs), in particular, raised average in-hospital stays for nursing home discharges: for those under 35 years the average in this category was 52.3 days; for those aged 35-64, 94 days; and for those 65 years and older, 23.5 days.

In addition, those dying in-hospital from their injuries tended to have longer hospital stays than did those who were discharged to home, regardless of age. By cause, this pattern of lengthier stays for decedents than for hume discharges held true for victims of falls (in each age group), for those patients for whom no cause was recorded (in each age group), and for those 35-64 years of age whose injury involved a motor vehicle. For MVA victims of other ages, decedents had an equivalent average length of stay (under 35, 6.9 days) or a shorter hospitalization than did those who survived to be discharged to home (65+, 4.9 and 12.3 days, respectively).

Table 5-2. Mean Length of Hospitalization by Age and Discharge Status for Hospitalized Head-Injured Residents, Rhode Island, 1981-1983

Discharge Status	Mean Number of Days Hospitalized			Number		
	0-34	35-64	65+	0-34	35-64	65+
Home Self-Care	4.4	8.5	10.5	2409	514	237
Died	6.7	13.1	13.8	63	47	71
Nursing Home	42.5	32.5	18.8	8	12	117

For the elderly with head injuries, negative outcomes (nursing home discharge or death) were most highly associated with falls. These most unfortunate accidents may reflect the frailty that occurs for some with advancing age, suggesting that the fall and resulting head injury may be contributory rather than elemental causes of institutionalization or death. For example, the percent of ICU admissions among head-injured fall victims but not among MVA victims rises with age ($p<0.001$). This suggests that falls among the elderly differ in some significant way from either falls among the non-elderly or MVAs among the elderly. The most likely explanation is that elderly victims of falls themselves are different in a way that makes them less likely to recover fully from their accidents.

Blue Cross is the expected source of payment listed most frequently in hospitalizations of head injury in Rhode Island. For those under age 65, 50 percent reported having Blue Cross. Among the elderly, on the other hand, over 90 percent expected Medicare to pay for their hospitalization.

There were significant differences in expected payment source among the remaining non-elderly cases. Pediatric head injuries (under age 15) were more likely to have reported Medicaid funding, and cases in which a child under five was injured had the highest concentration citing Medicaid, 26 percent ($p<0.001$). In contrast, cases in which the patient was 15 to 34 years were more likely than all others to report that they would pay their own bill ($p<0.001$). In particular, 26 percent of those aged 25-34 years listed "self" as the expected source of payment.

On the other hand, there were no significant differences in the length of hospitalization by expected payment source and age. Within each age group (under 35, 35-64, 65+), expected source of payment apparently did not influence the length of stay for those with head injuries.

The gravity of the head injury relative to other diagnoses may be reflected in the listed position of that injury. By cause, the head injuries of fall victims are most likely to be listed as the primary diagnosis (87%). With MVA, head injury is somewhat less likely to be the primary diagnosis (79%). In fact, MVA victims have the highest average number of diagnoses, 4.0, per person, which may explain their lengthier hospitalization and higher probability of an ICU admission, as described above.

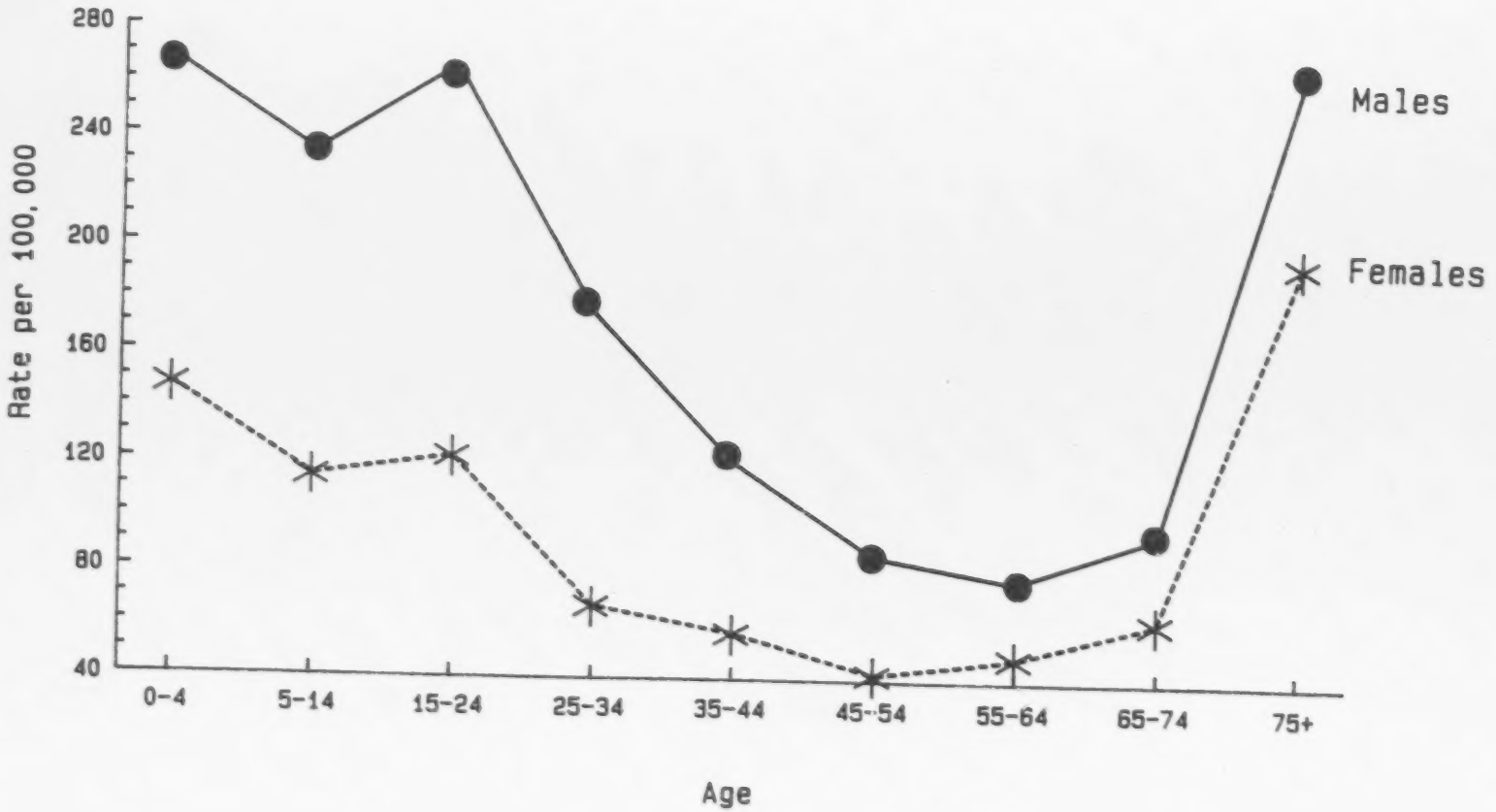
Those injuries which have no specified cause, however, are least likely to have the head injury listed as the primary diagnosis (75%). As shown in Table 5-1, these cases without E-codes are most common among those aged 65 and older. The elderly have in addition a higher number of diagnoses on average than do younger patients (4.9 diagnoses for those 65 years and older versus 3.3 for those under 65). It is conceivable that their head injuries may be incidental to other conditions,

possibly of a chronic nature, that precipitated the hospitalization.

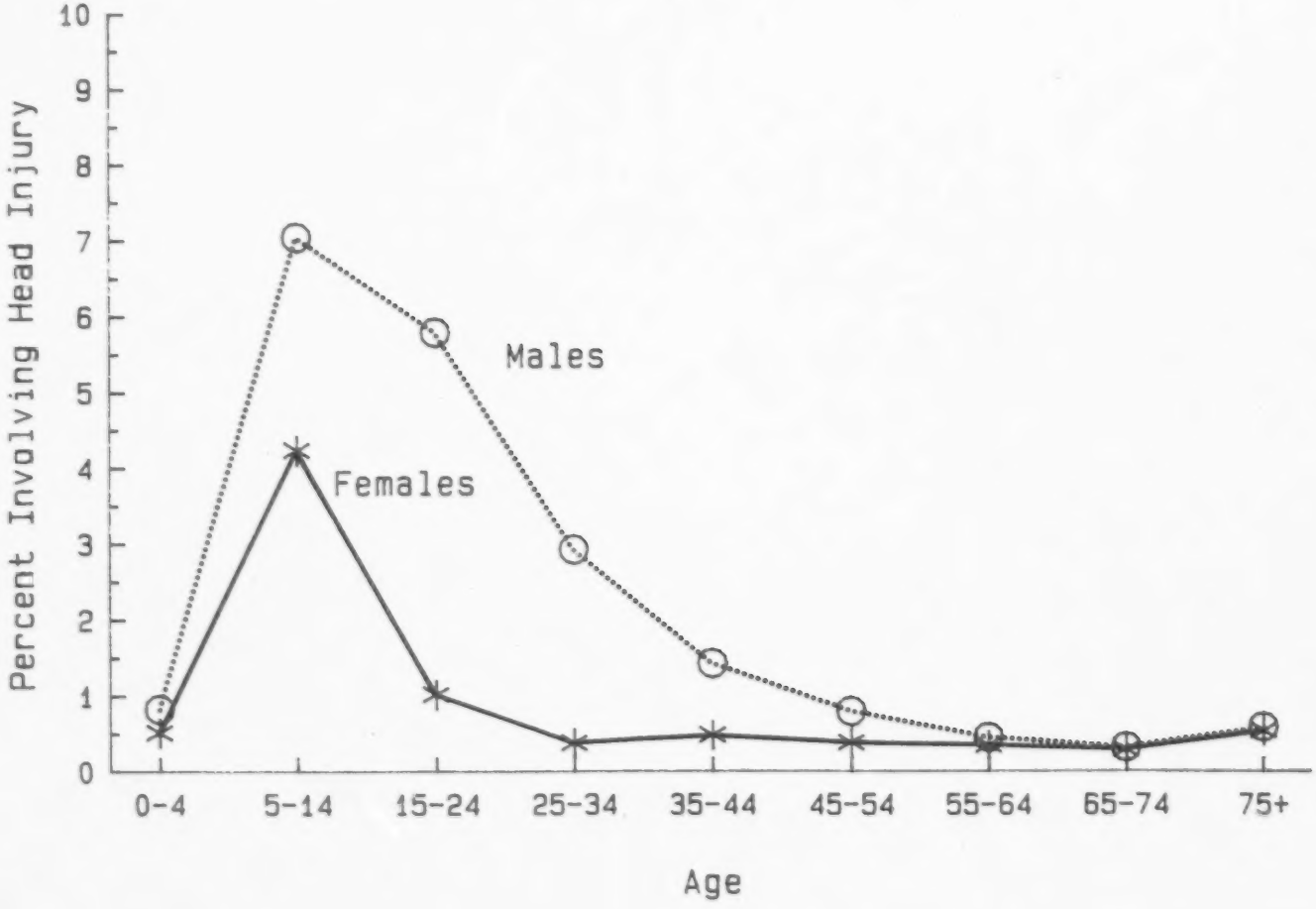
For example, stroke (ICD-9 430-438) and acute myocardial infarction (ICD-9 410) are highly visible conditions to which the elderly are susceptible. Head injury is less significant medically when stroke or heart attack also have been diagnosed (less than one percent of the cases considered here). Those with head injuries and either of these conditions are more likely to have their head injury listed in the third or more peripheral position than those with head injuries who have not had a stroke or heart attack ($p<0.001$).

In most cases, however, a diagnosis of head trauma has major implications. In 83 percent of these cases the head injury was the primary diagnosis. In another ten percent, that injury was the first additional diagnosis. The average length of stay for those hospitalized with any head injury was 7.8 days. Five percent were discharged to a nursing home or chronic care facility, three percent were discharged to another short-term hospital, and another five percent died. By any measure, the impact of head trauma on the public health cannot be discounted.

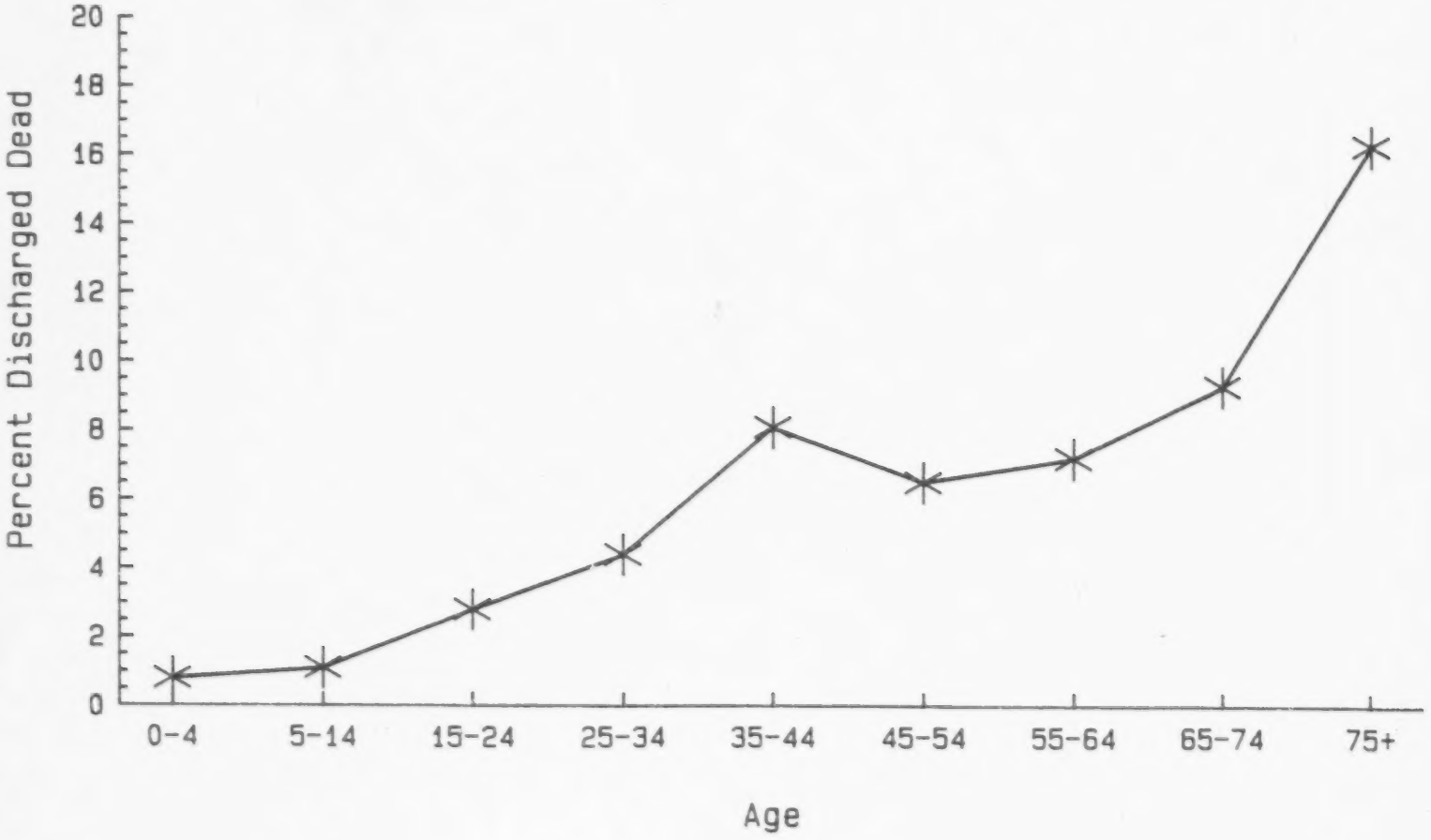
Annual Head Injury Hospital Discharge Rate
by Age and Sex, Rhode Island, 1981 - 1983



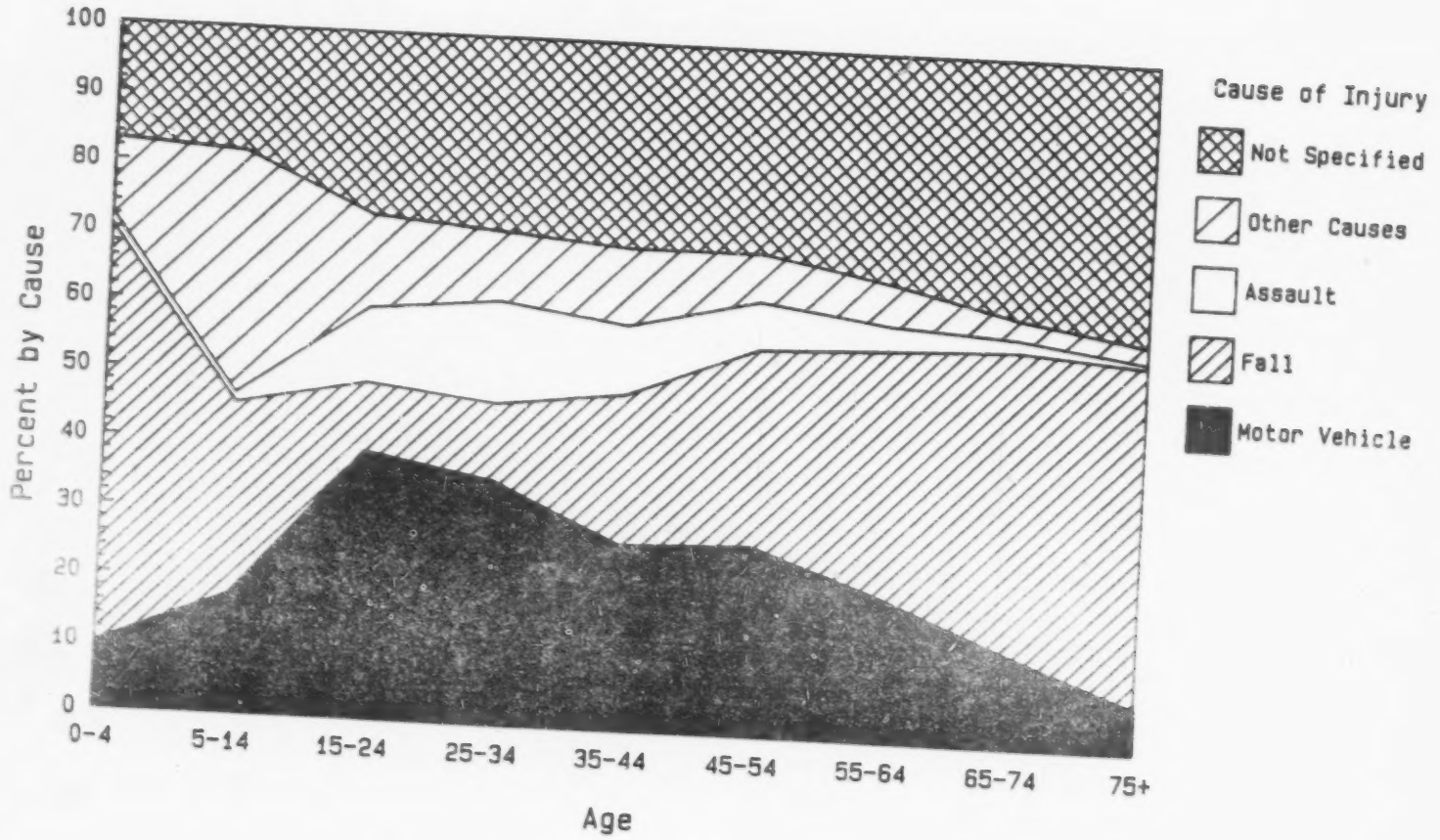
Head Injury Hospitalizations as a Percentage of All Hospitalizations by Age for Each Sex, Rhode Island, 1981 - 1983



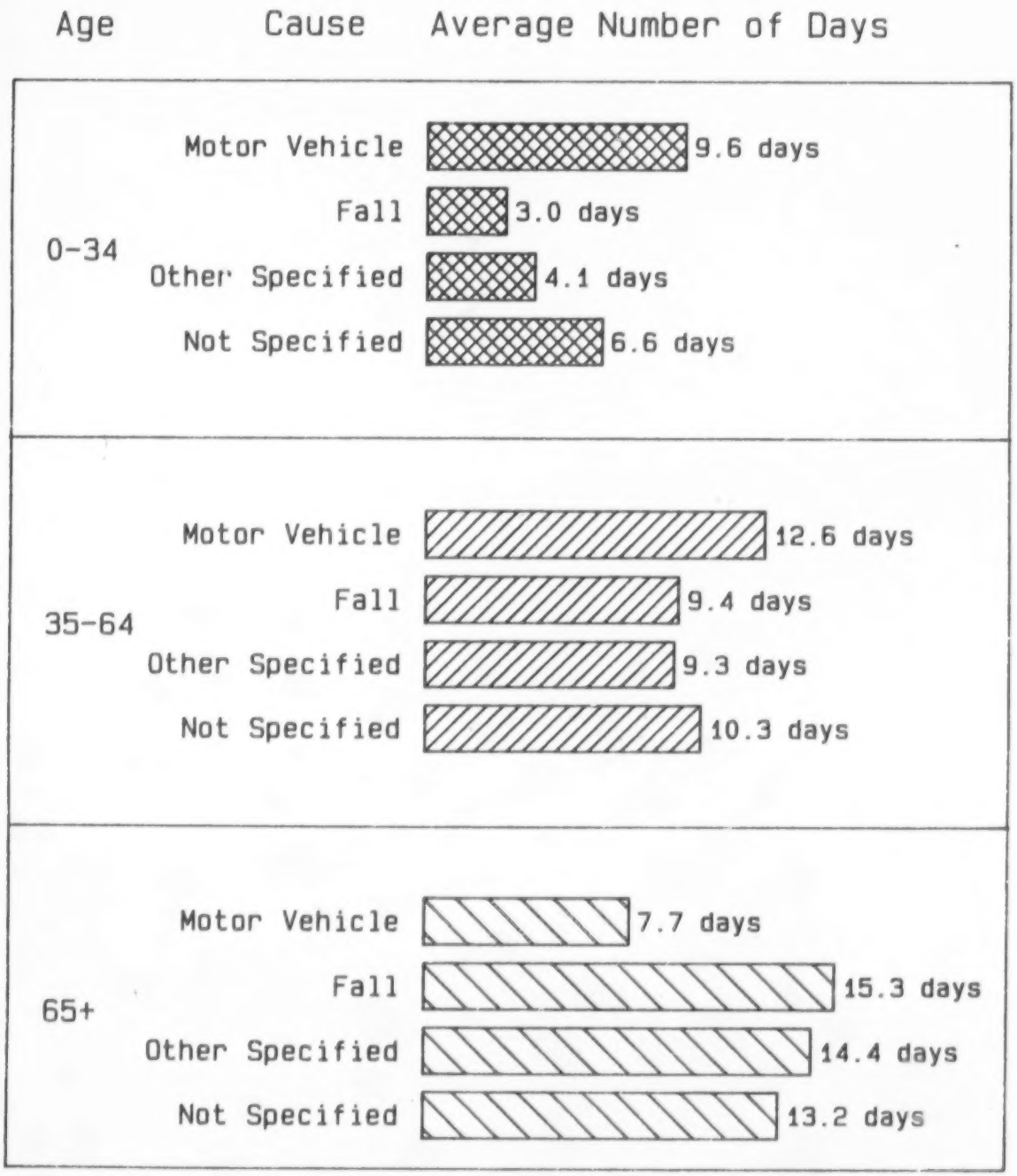
Death Rate among Hospital Discharges with a Diagnosis of Head Injury, by Age, Rhode Island, 1981 - 1983



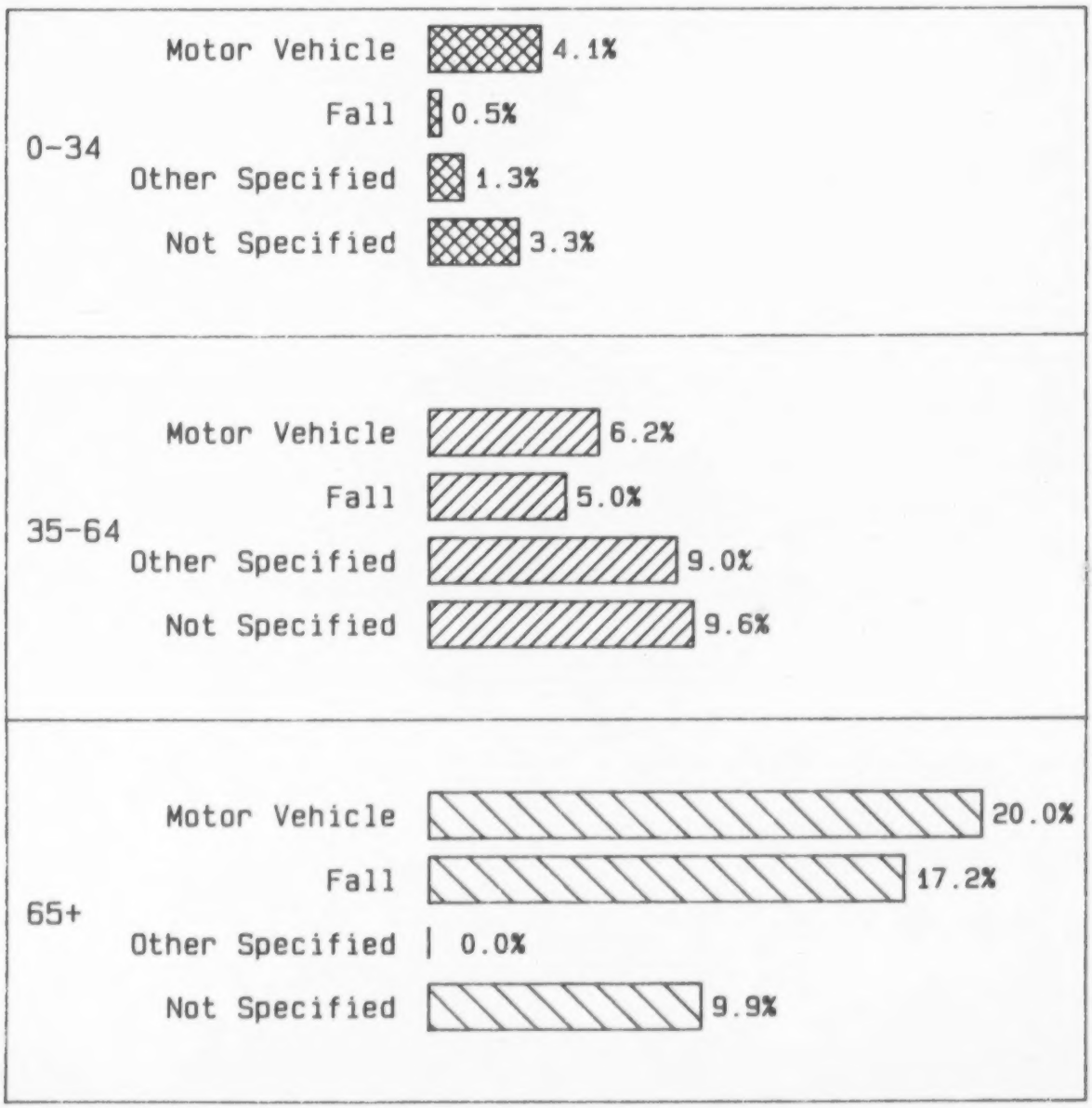
Cause of Hospitalized Head Injury by Age, Rhode Island, 1981 - 1983



Mean Length of Hospital Stay in Days by Cause of Head Injury and Age, Rhode Island, 1981 - 1983



Percentage Dying In-Hospital by Cause of Head Injury and Age, Rhode Island, 1981 - 1983



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